

FIG. 1A

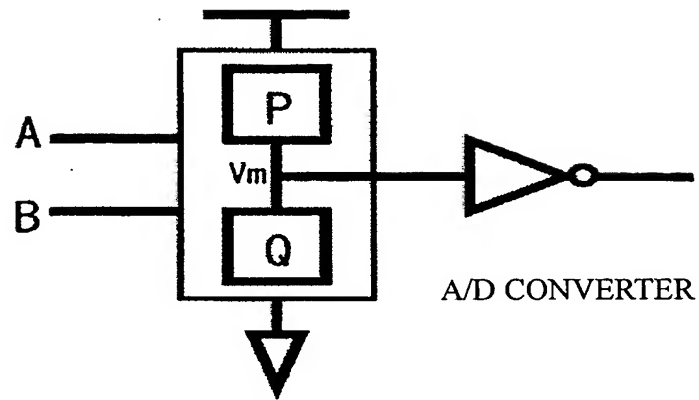


FIG. 1B

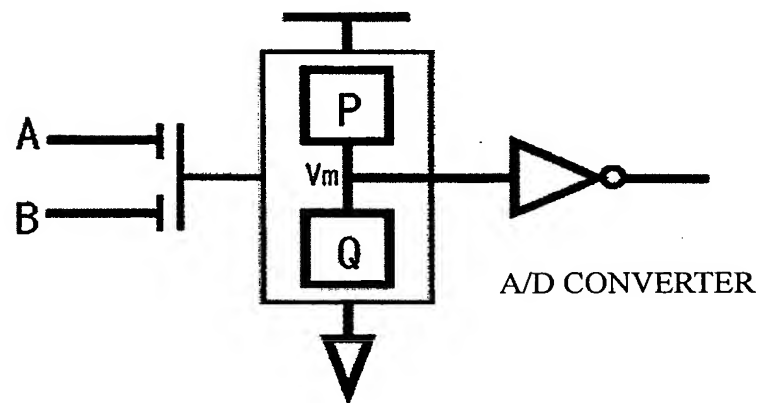


FIG. 2A

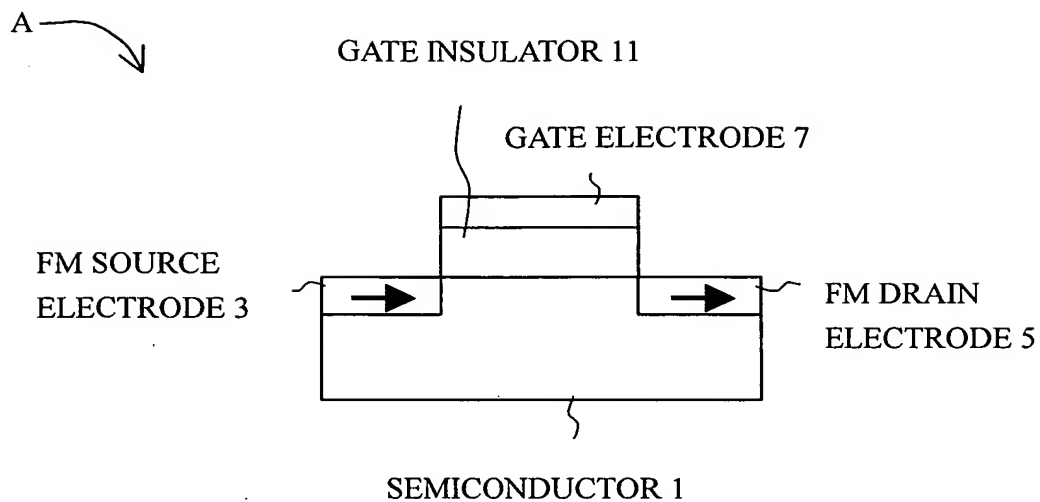


FIG. 2B

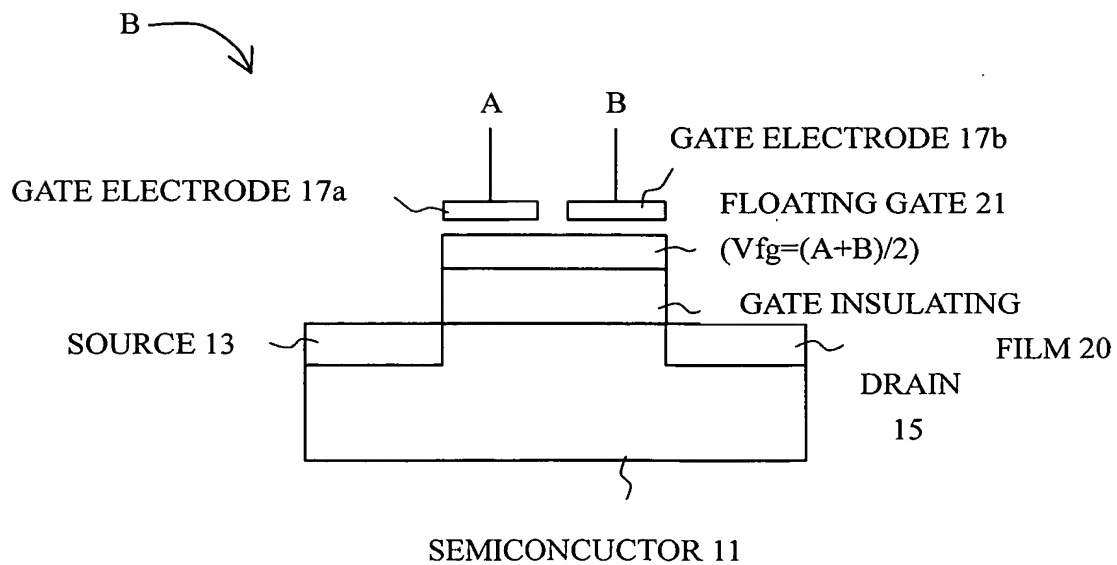


FIG. 3A

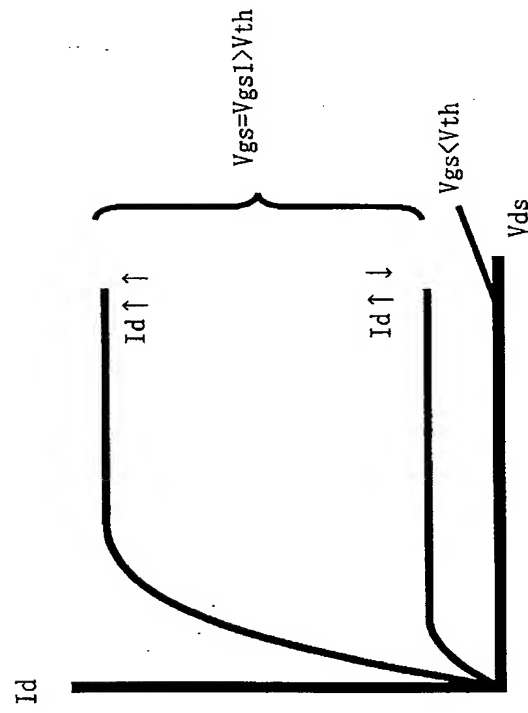


FIG. 3B

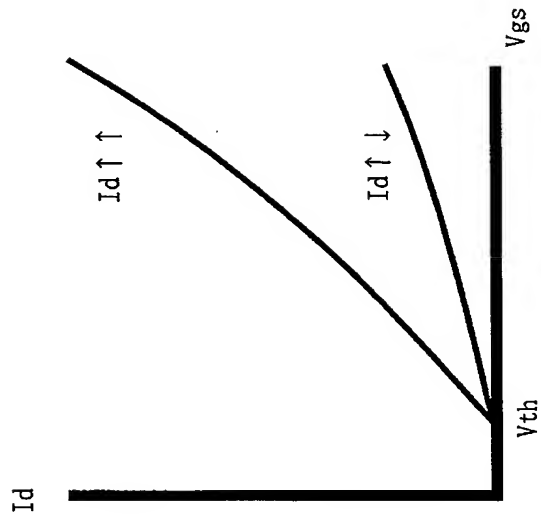


FIG. 4

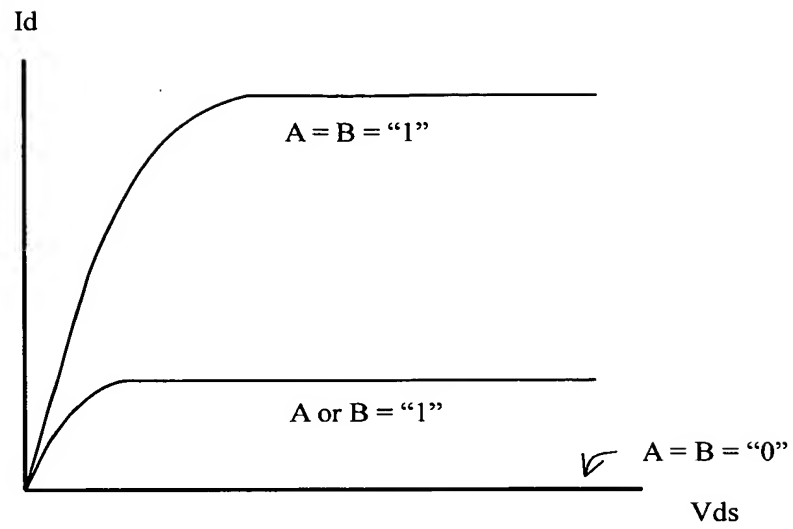


FIG. 5A

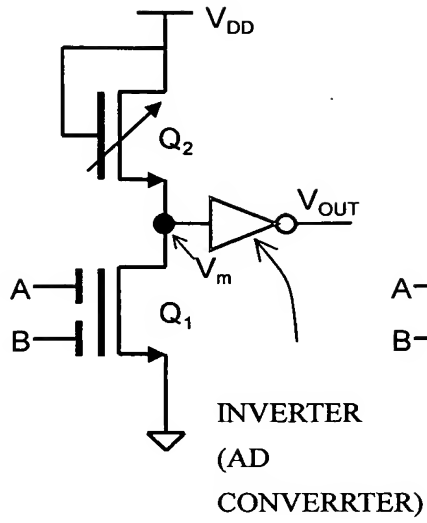


FIG. 5B

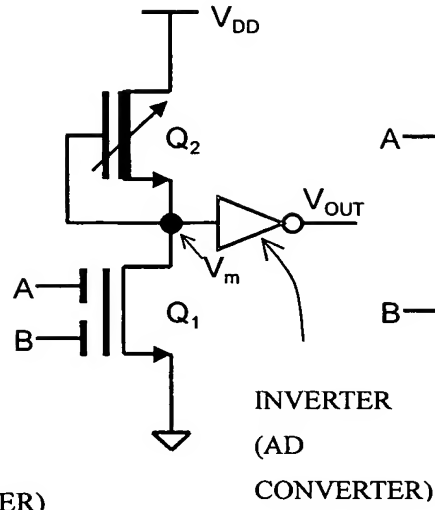


FIG. 5C

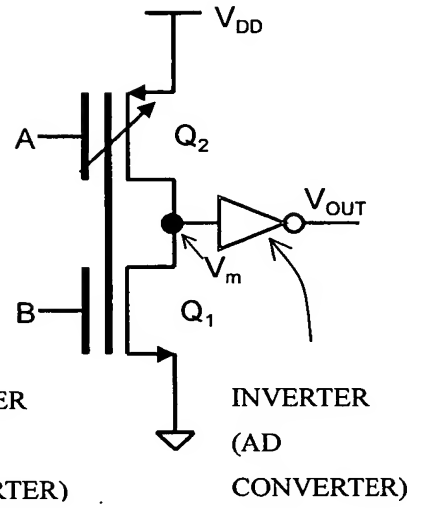


FIG. 6

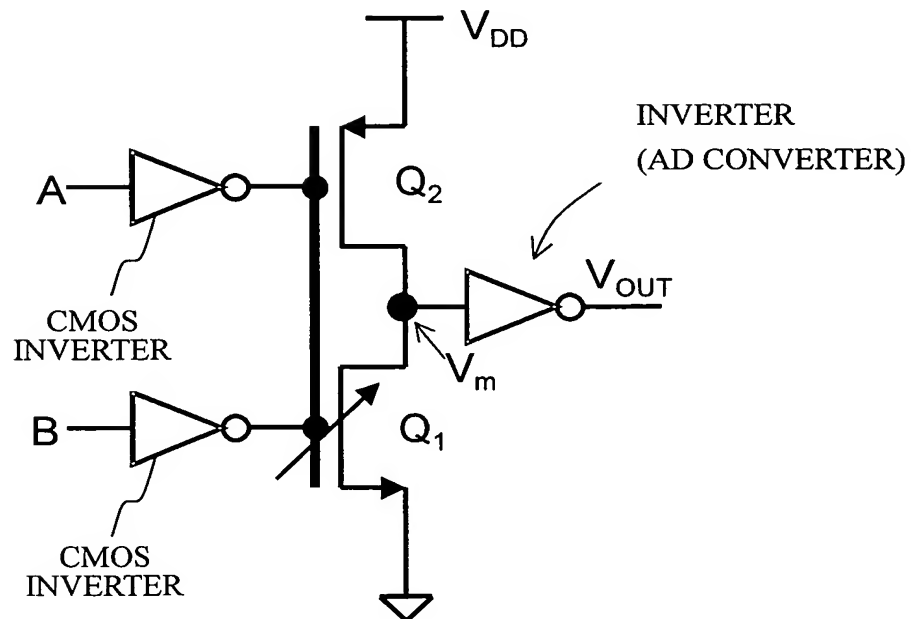


FIG. 7

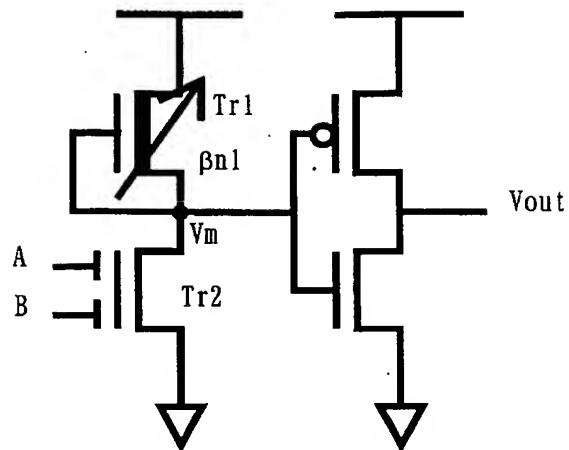


FIG. 8

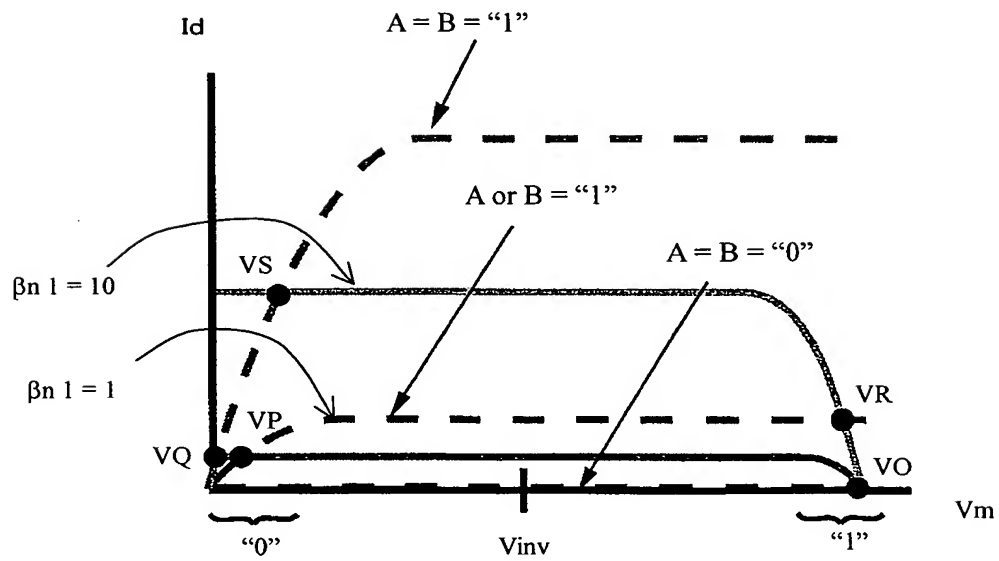


FIG. 9

(A)				(B)			
$\beta_{n1} = 1$				$\beta_{n1} = 10$			
A	B	V _m	V _{out}	A	B	V _m	V _{out}
0	0	V _O	"0"	0	0	V _O	"0"
0	1	V _P	"1"	0	1	V _R	"0"
1	1	V _Q	"1"	1	1	V _S	"1"

OR

AND

FIG. 10

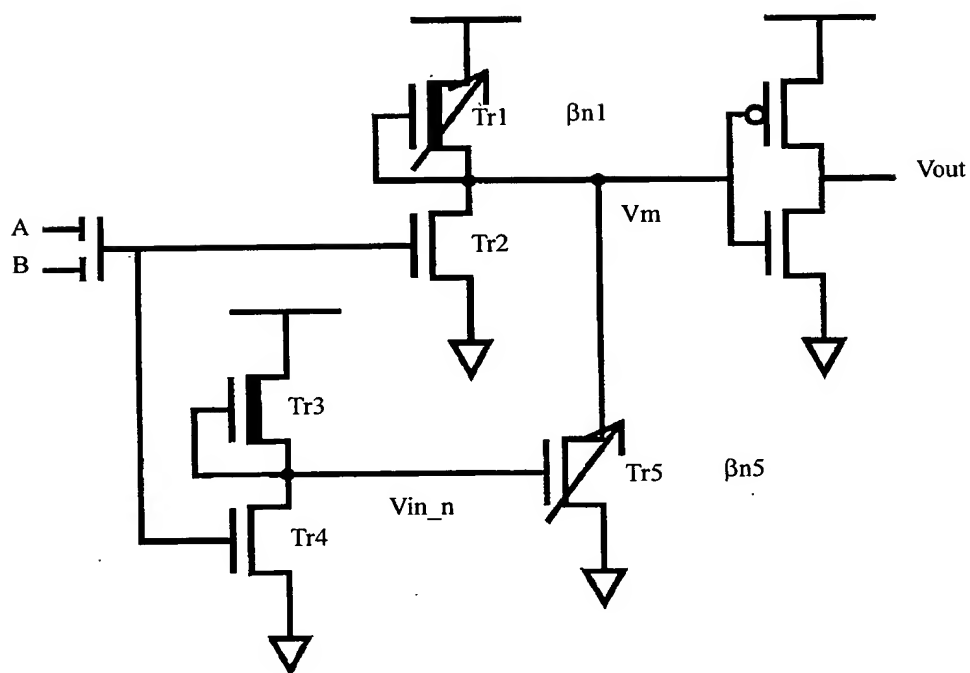


FIG. 11

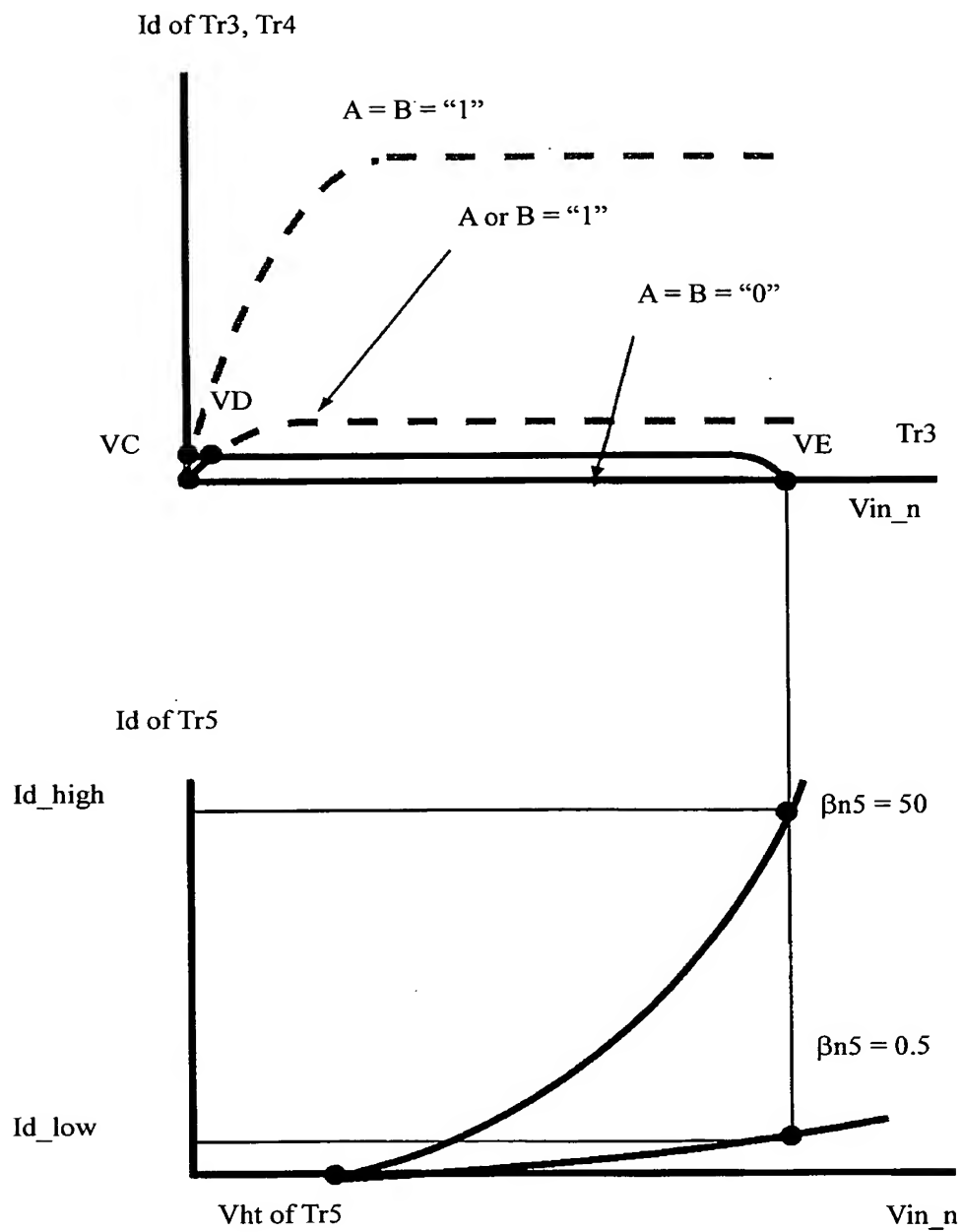


FIG. 12A

FIG. 12B

FIG. 13C

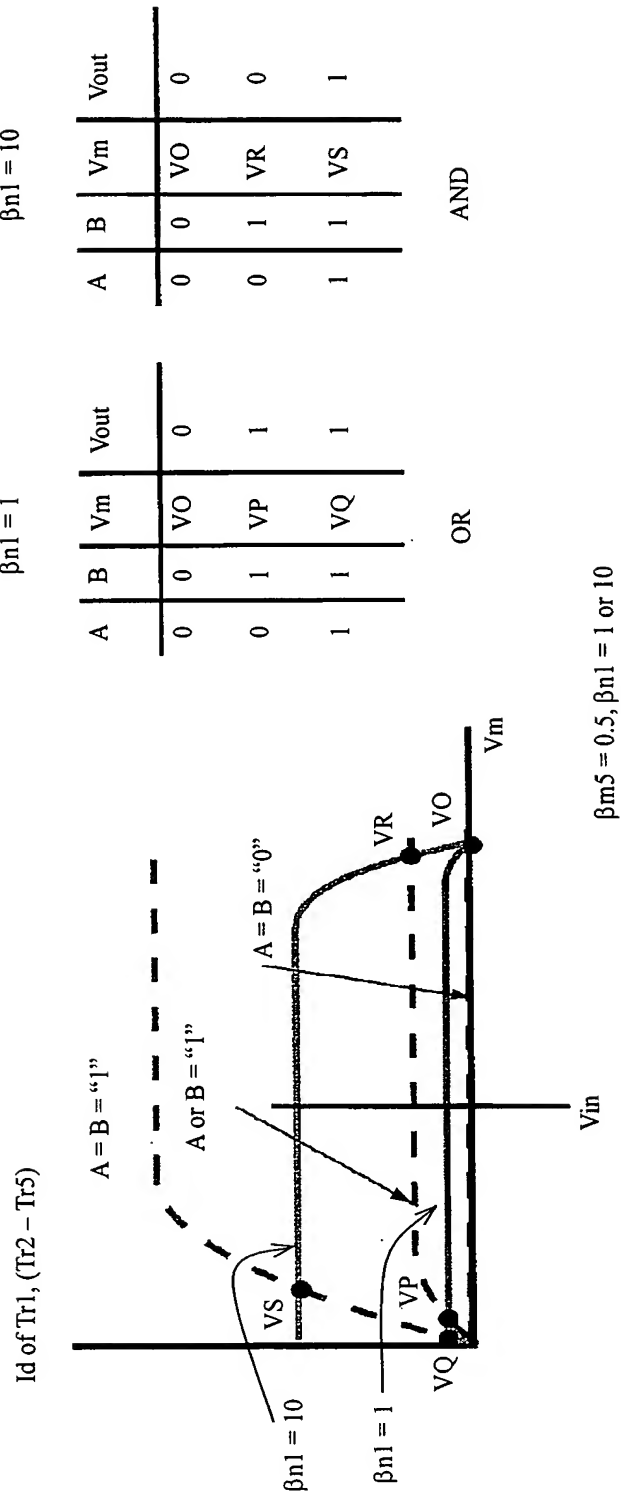


FIG. 13B

A	B	V _m	V _{out}
0	0	V _T	0
0	1	V _R	0
1	1	V _S	1

XNOR

FIG. 13A

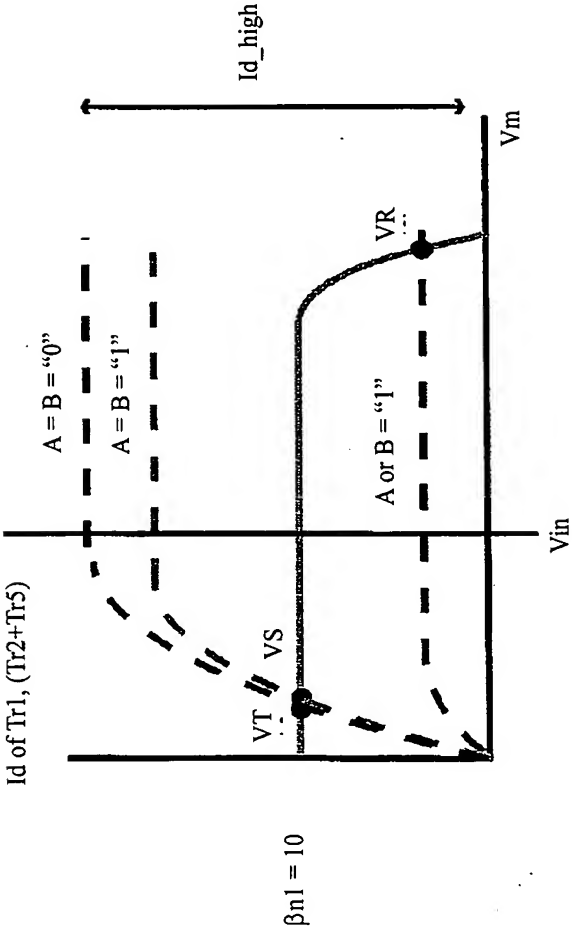


FIG. 14B

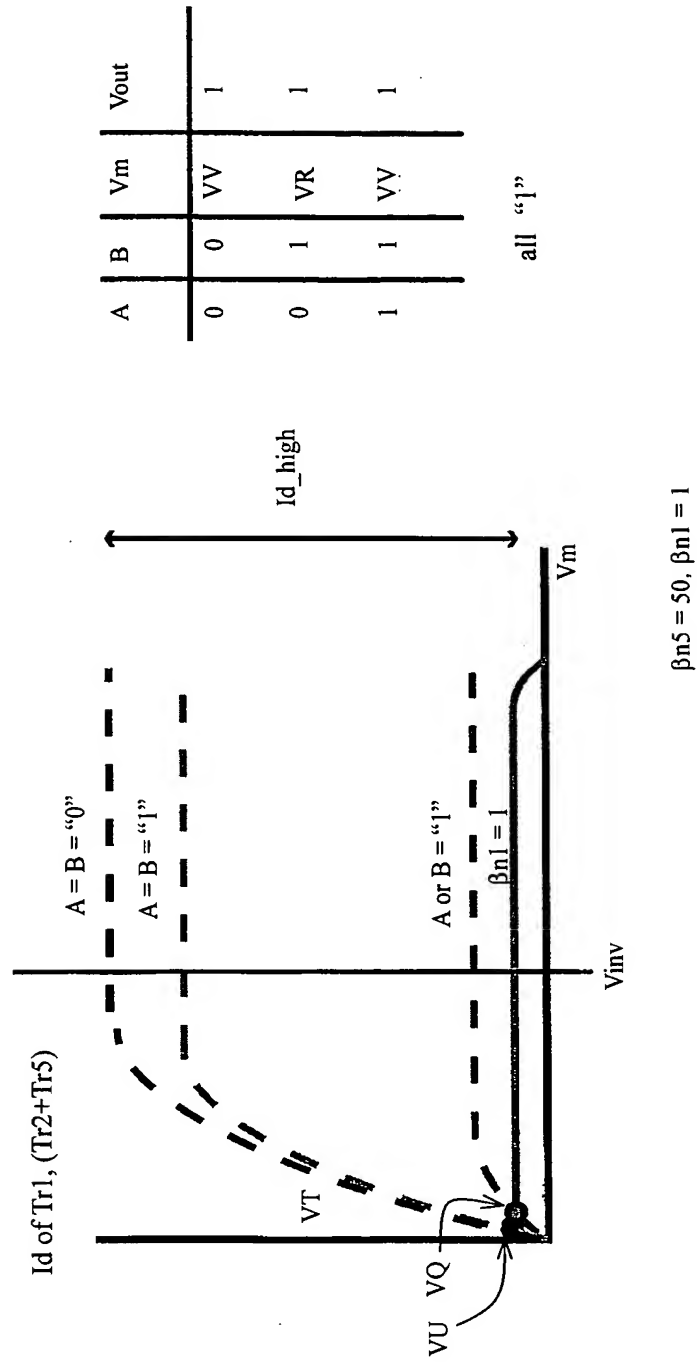


FIG. 15

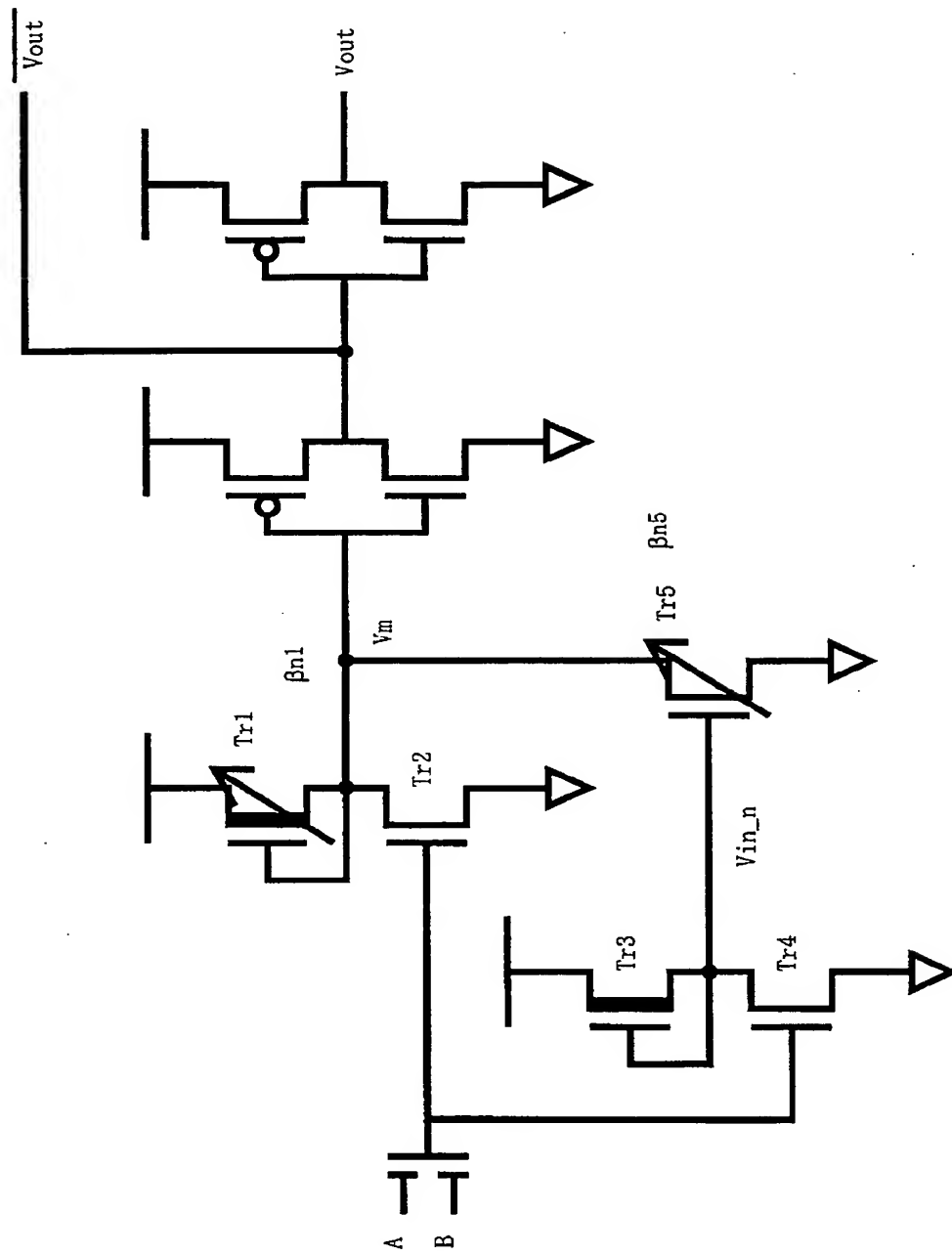


FIG. 16A

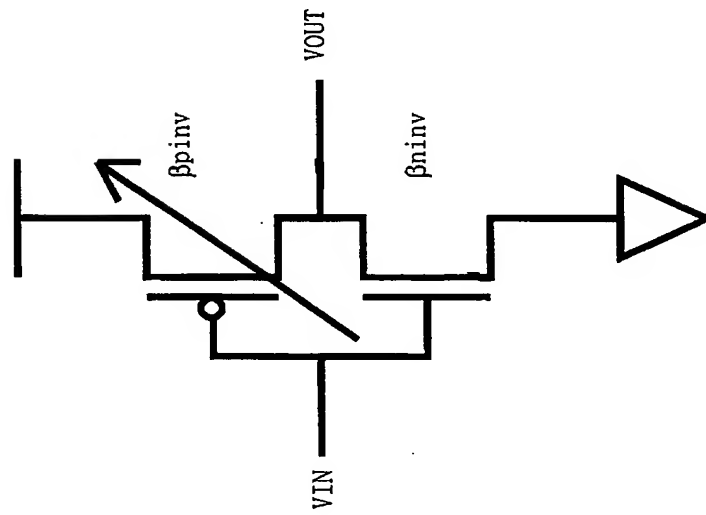


FIG. 16B

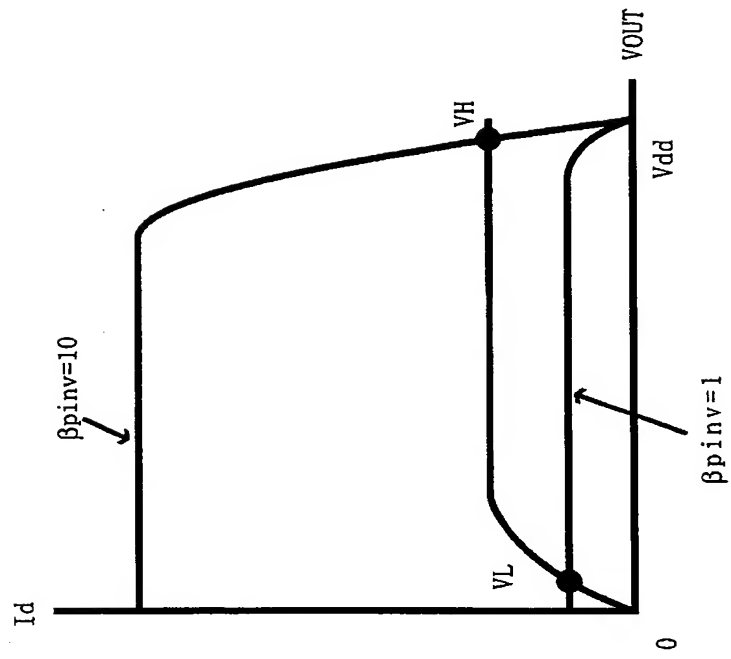


FIG. 17

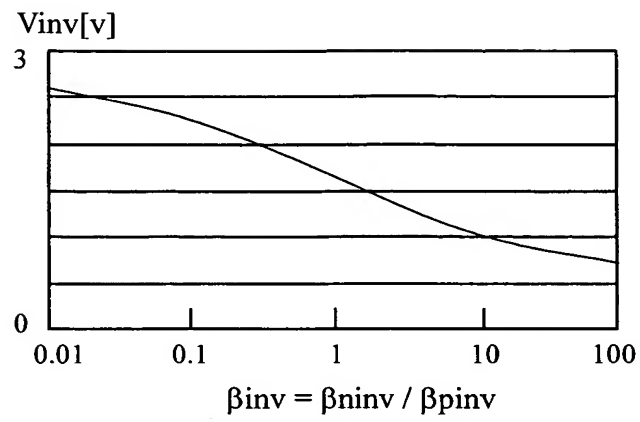


FIG. 18

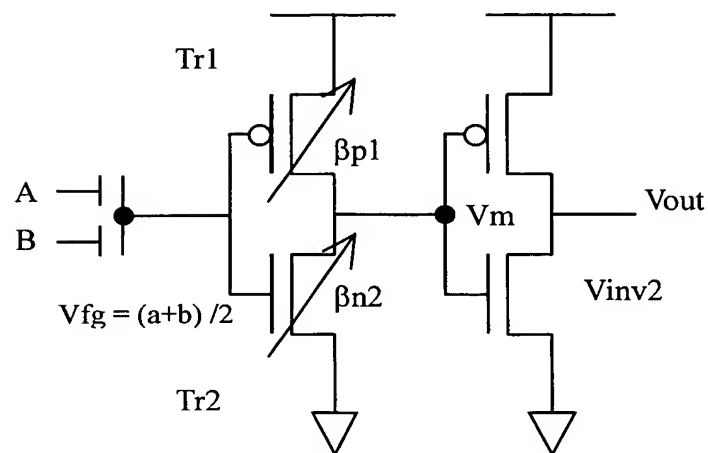


FIG. 19B

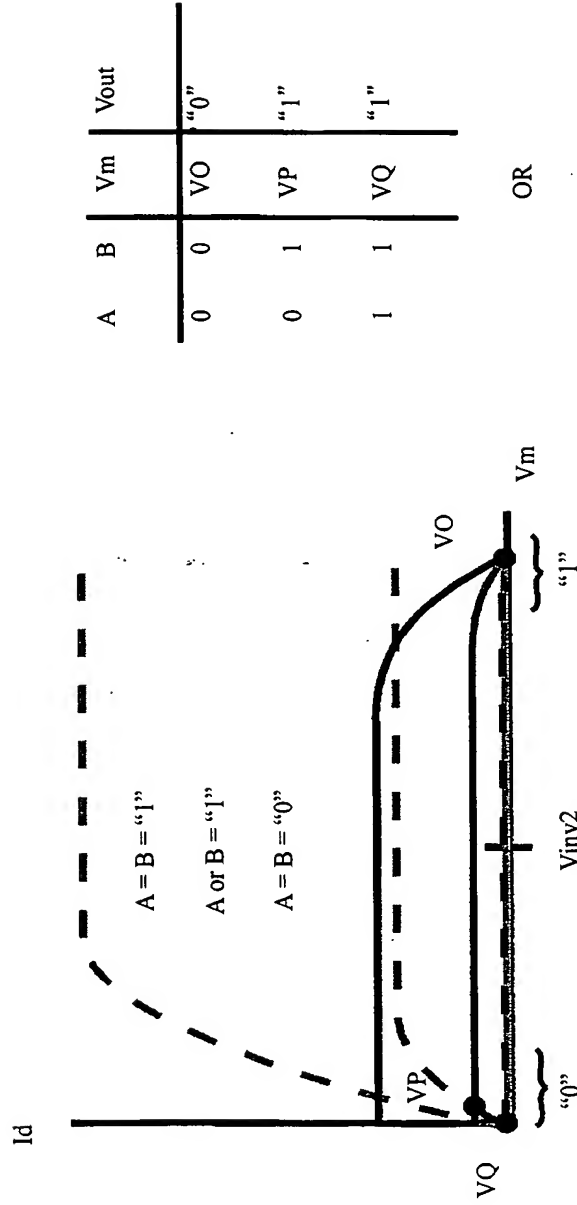
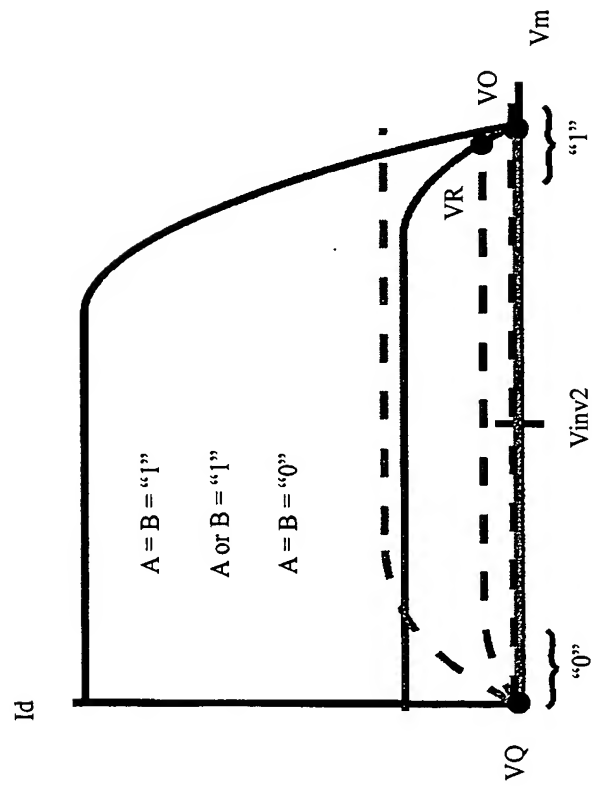


FIG. 19A

$$\beta_{p1} = 1, \beta_{n2} = 10$$

FIG. 20A



$$\beta_{p1} = 10, \beta_{n2} = 1$$

FIG. 20B

A	B	V_m	V_{out}
0	0	V_O	"0"
0	1	V_R	"0"
1	1	V_Q	"1"

AND

FIG. 21

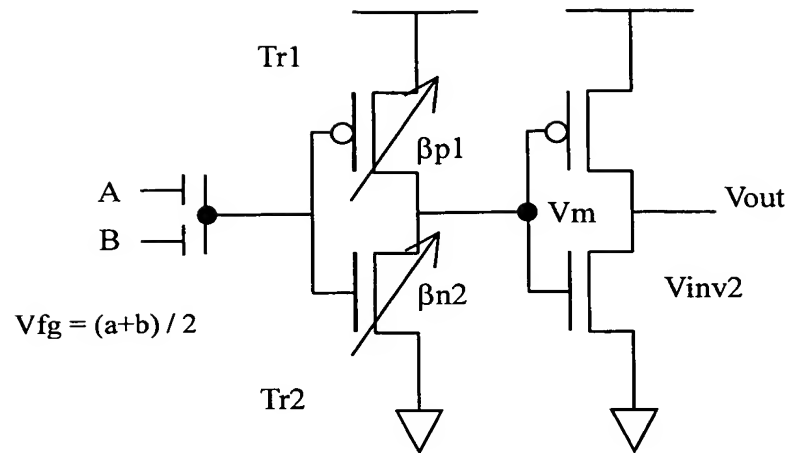
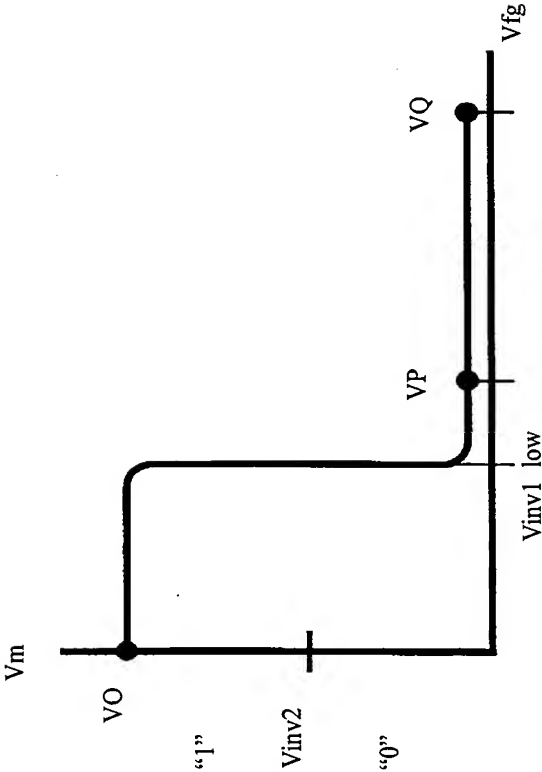


FIG. 22B

A	B	V _m	V _{out}
0	0	V _O	"0"
0	1	V _P	"1"
1	1	V _Q	"1"

OR

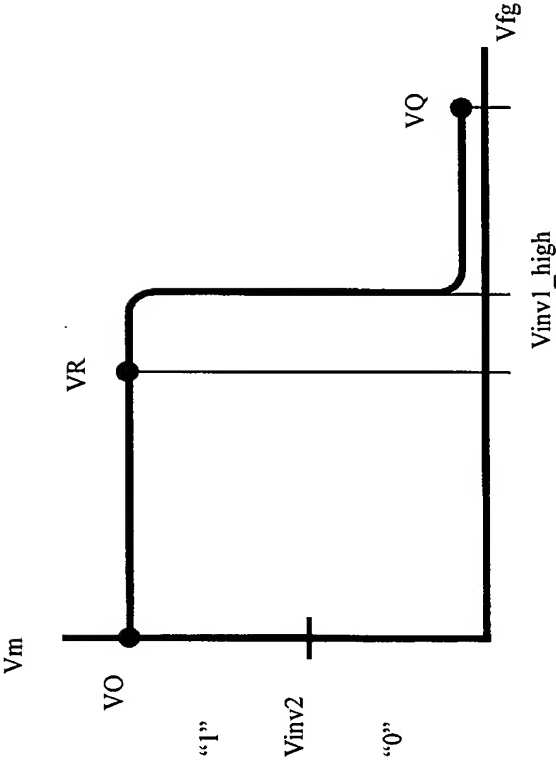
FIG. 22A



A	0	1
B	0	1

V_{inv1_low} ($\beta_{p1} = 1, \beta_{n2} = 10$)

FIG. 23A



A	0	0	1
B	0	1	1

Vinv1_low ($\beta_{p1} = 10, \beta_{n2} = 1$)

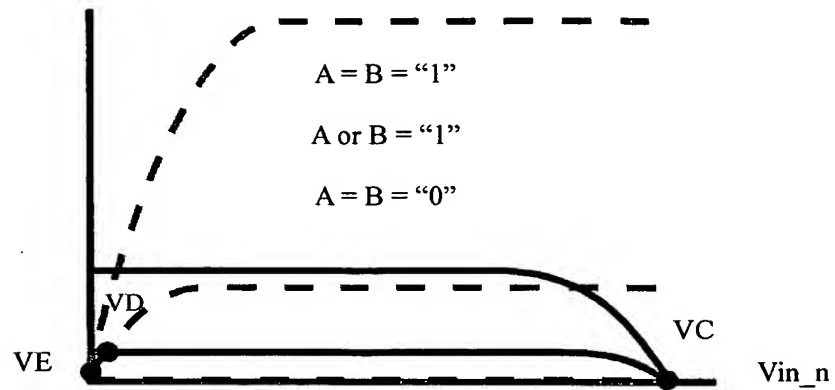
FIG. 23B

A	B	Vm	Vout
0	0	VO	"0"
0	1	VR	"0"
1	1	VQ	"1"

AND

FIG. 25

Id of Tr3, Tr4



Id of Tr5

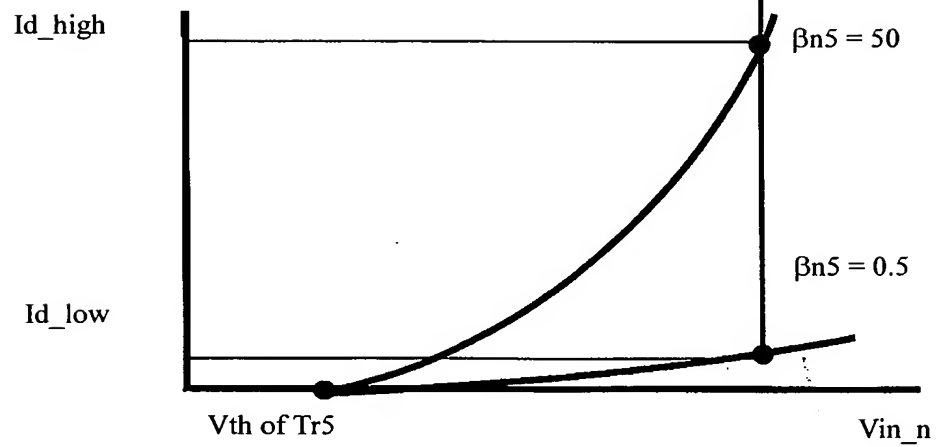


FIG. 26A

FIG. 26B

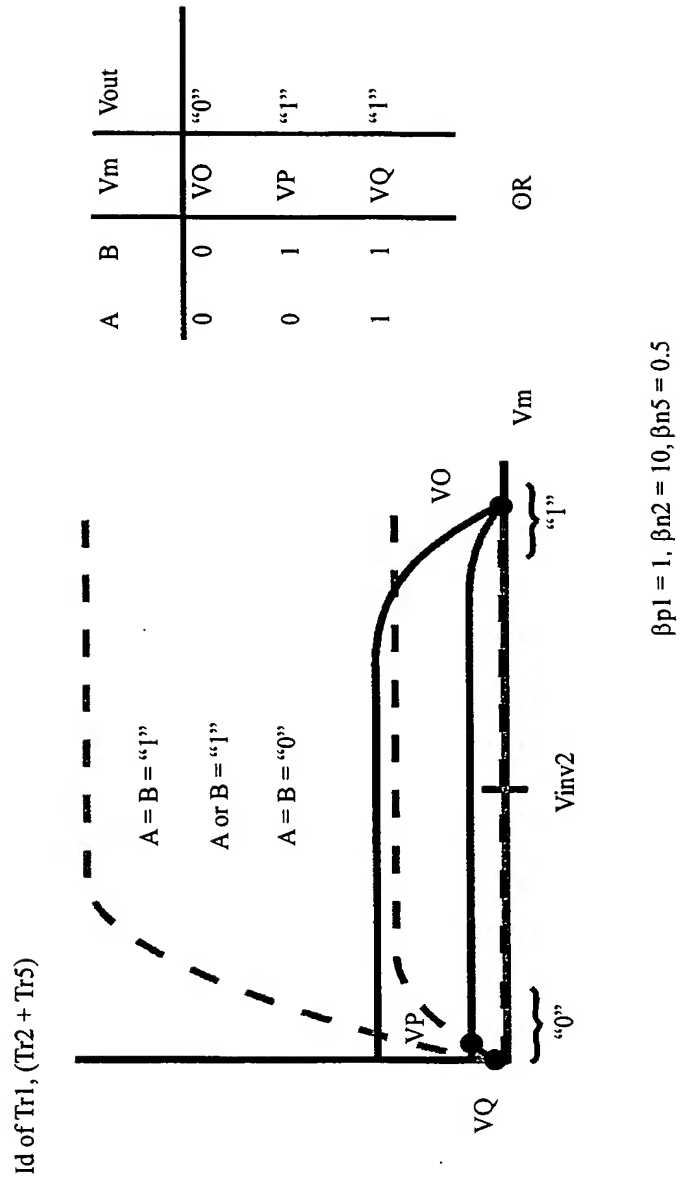
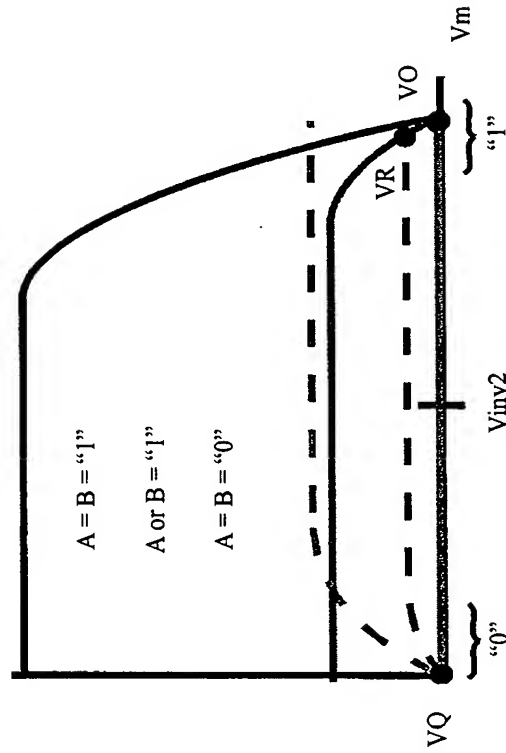


FIG. 27A

Id of Tr1, (Tr2 + Tr5)



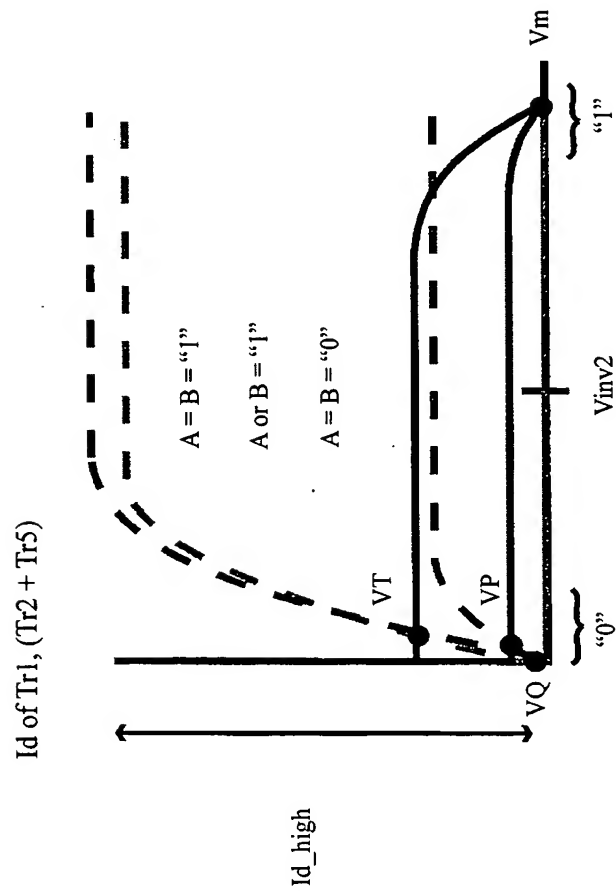
$$\beta p1 = 10, \beta n2 = 1, \beta n5 = 0.5$$

FIG. 27B

A	B	Vm	Vout
0	0	VO	"0"
0	1	VR	"0"
1	1	VQ	"1"

AND

FIG. 28A



$$\beta_{p1} = 1, \beta_{n2} = 10, \beta_{n5} = 50$$

FIG. 28B

A	B	Vm	Vout
0	0	VT	"1"
0	1	VP	"1"
1	1	VQ	"1"

all "1"

FIG. 29B

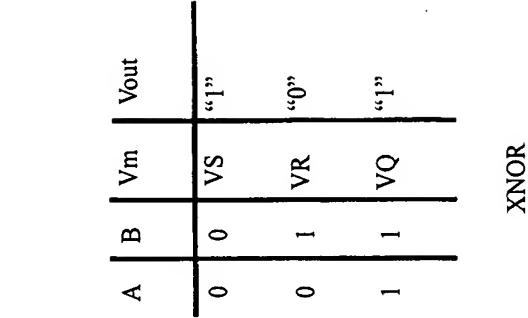


FIG. 29A

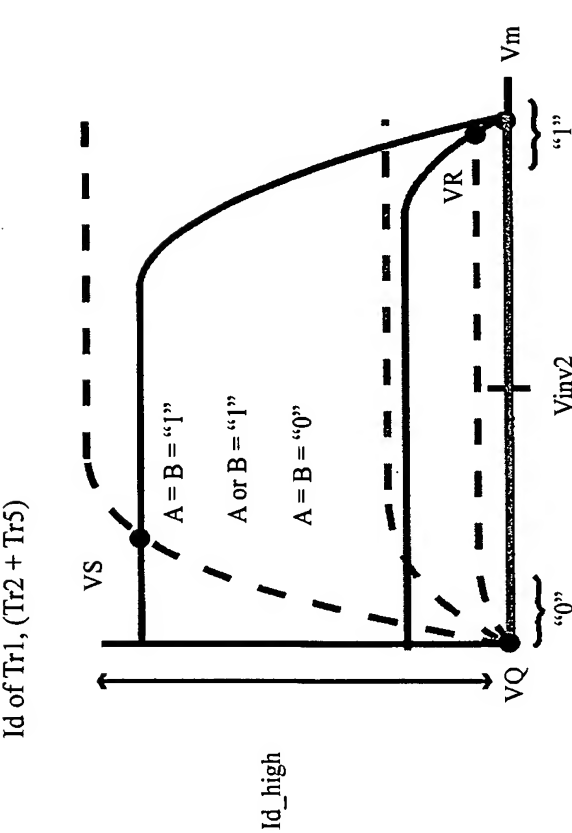


FIG. 30

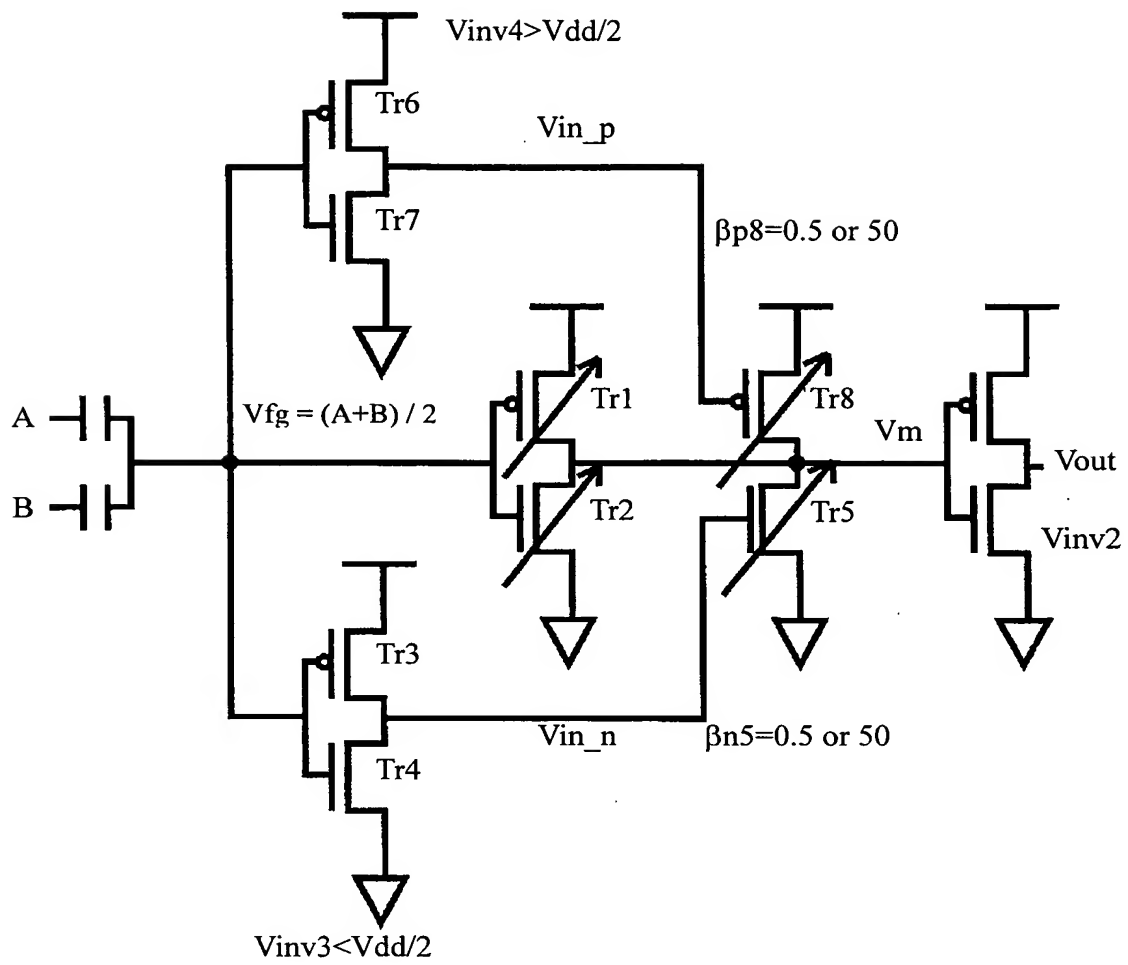


FIG. 31

Id of Tr6, Tr7

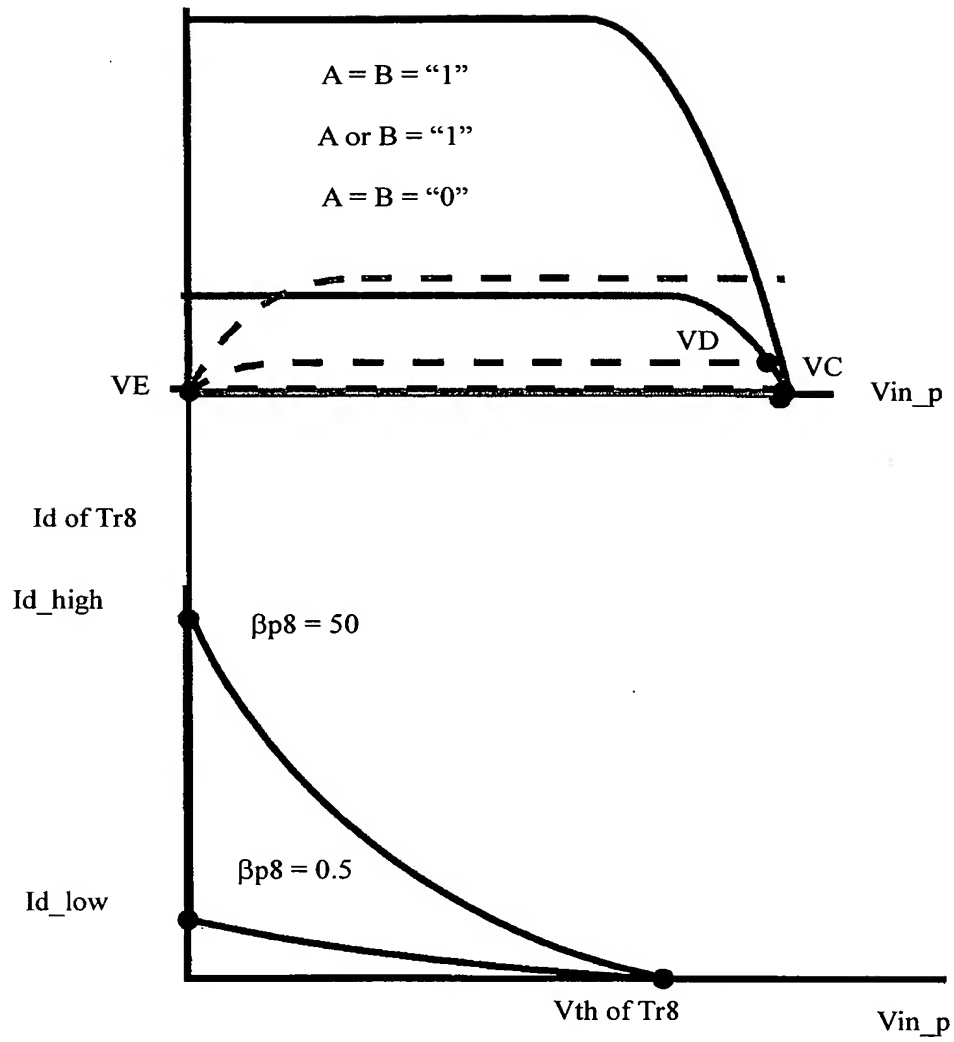
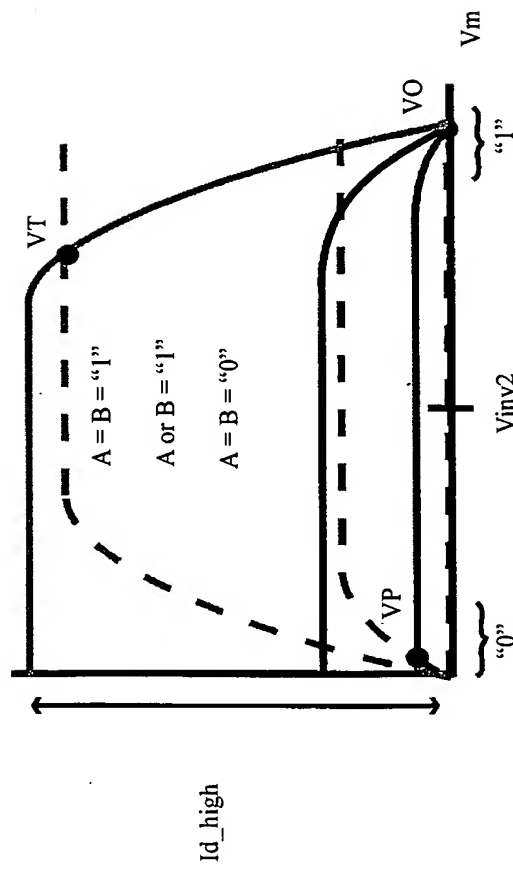


FIG. 32B

FIG. 32A

$I_d \text{ of } (Tr1 + Tr8), (Tr2 + Tr5)$



A	B	V_m	V_{out}
0	0	V_O	"0"
0	1	V_P	"1"
1	1	V_T	"0"

XOR

$$\beta_{p1} = 1, \beta_{n2} = 10, \beta_{n5} = 0.5, \beta_{p8} = 50$$

FIG. 33A

Id of (Tr1 + Tr8), (Tr2 + Tr5)

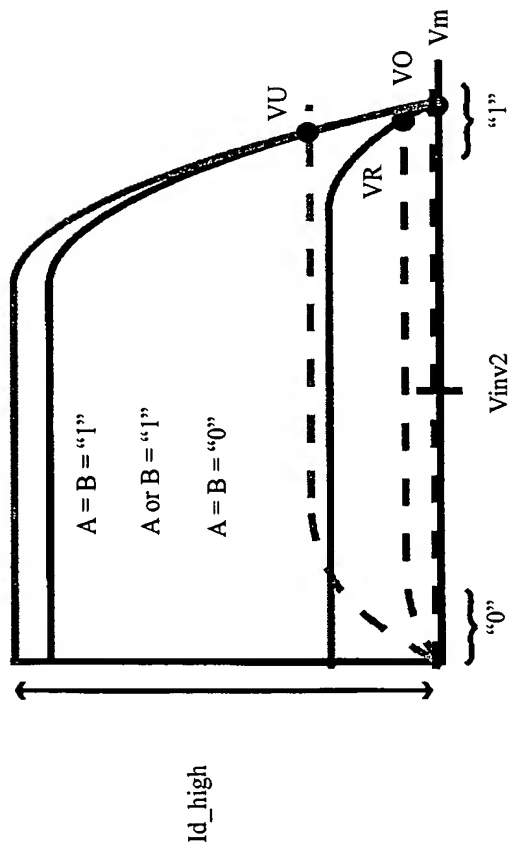


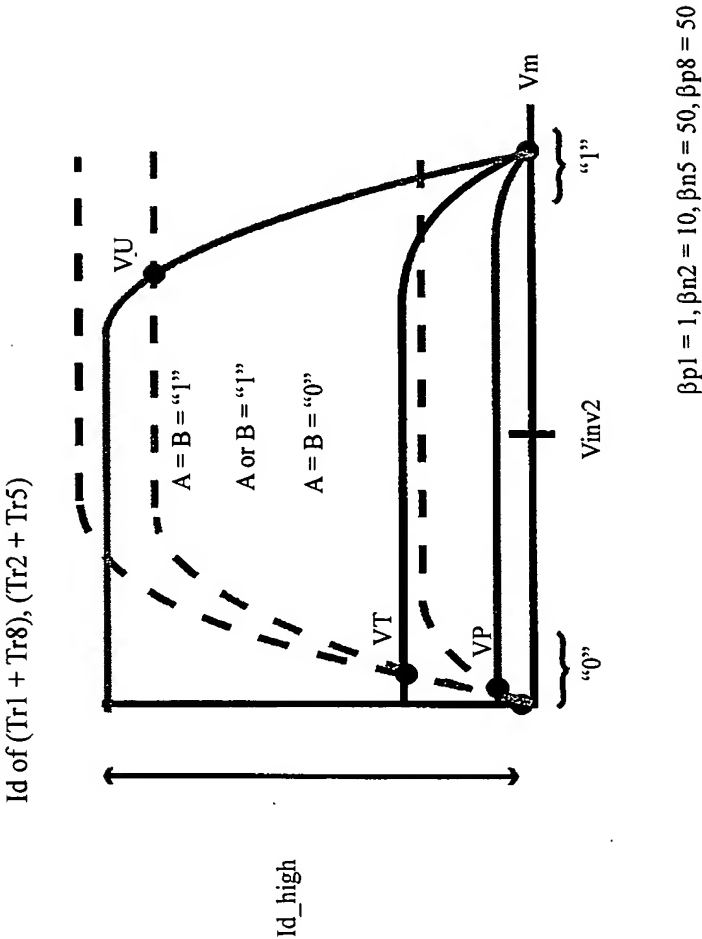
FIG. 33B

A	B	V _m	V _{out}
0	0	V _O	"0"
0	1	V _R	"0"
1	1	V _U	"0"

all "0"

$\beta_{p1} = 10, \beta_{n2} = 1, \beta_{n5} = 0.5, \beta_{p8} = 50$

FIG. 34A



$\beta_{p1} = 1, \beta_{n2} = 10, \beta_{n5} = 50, \beta_{p8} = 50$

FIG. 34B

A	B	V _m	V _{out}
0	0	V _T	"1"
0	1	V _P	"1"
1	1	V _U	"0"

NAND

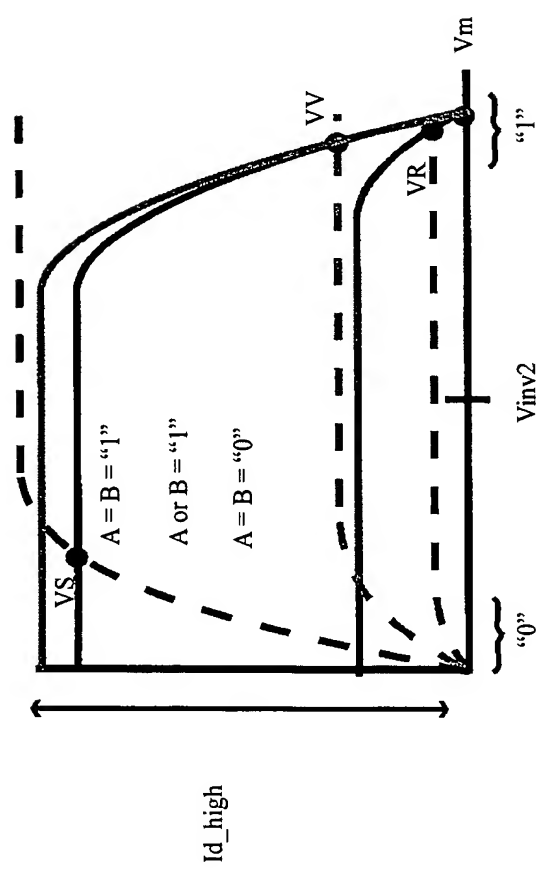
FIG. 35B

Id of (Tr1 + Tr8), (Tr2 + Tr5)

A	B	V _m	V _{out}
0	0	V _S	"1"
0	1	V _R	"0"
1	1	V _V	"0"

NOR

FIG. 35A



$\beta_{p1} = 10, \beta_{n2} = 1, \beta_{n5} = 50, \beta_{p8} = 50$

FIG. 36

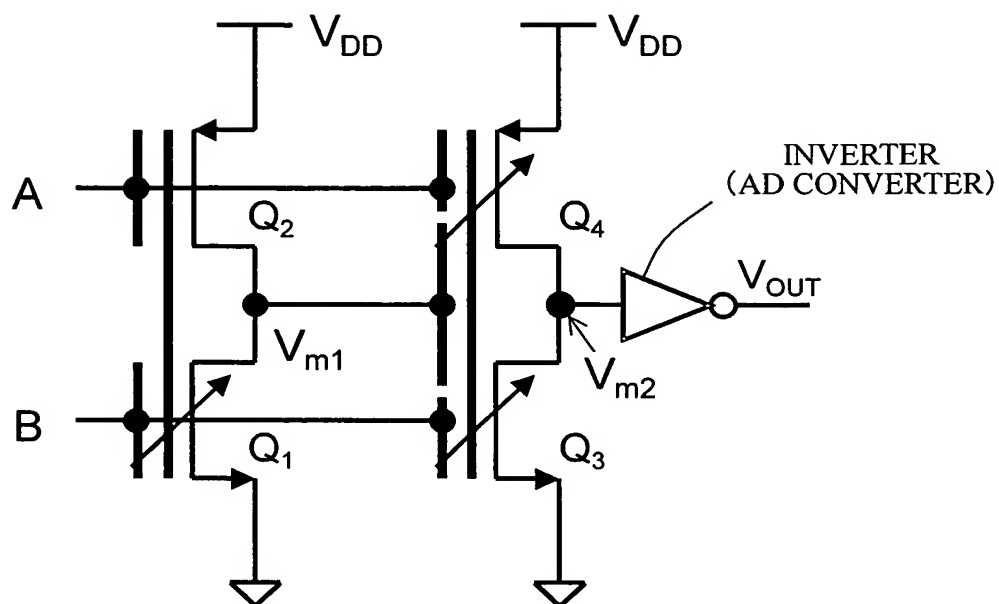


FIG. 37

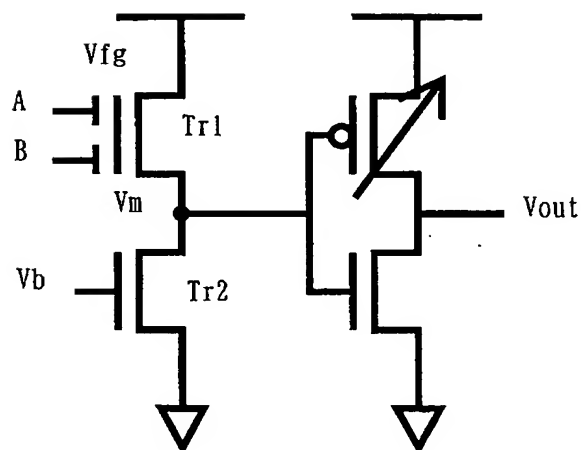


FIG. 38

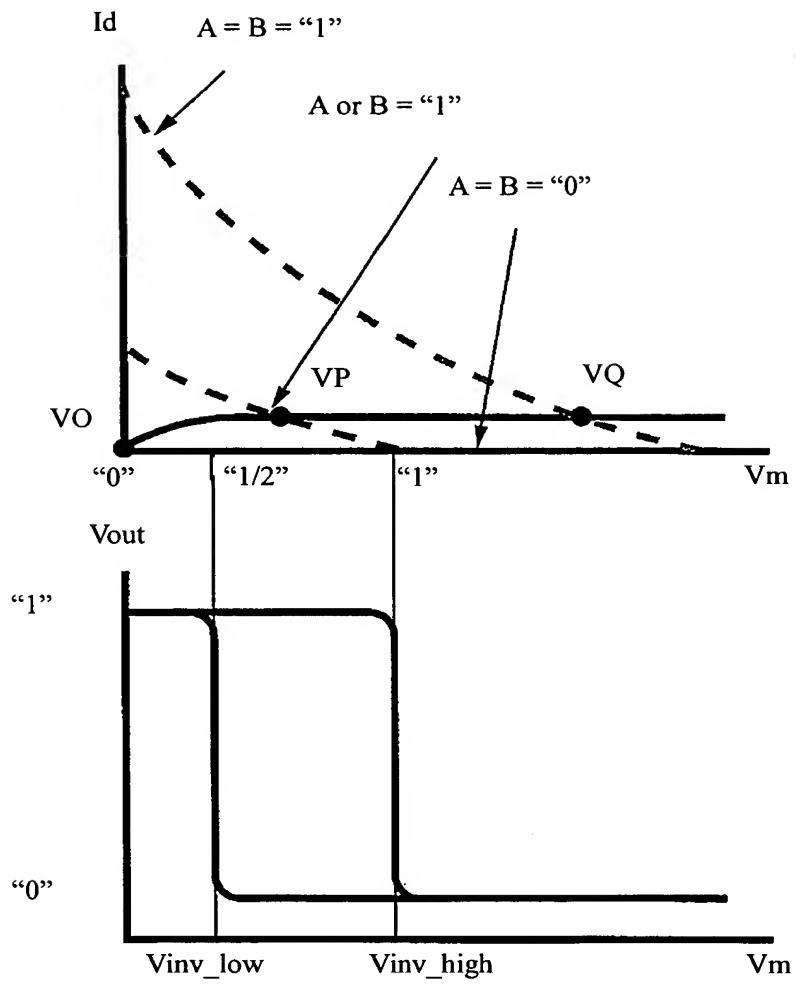


FIG. 39

			Vout	
A	B	Vm	Vinv_low	Vinv_high
0	0	VO	1	1
0	1	VP	0	1
1	1	VQ	0	0

NOR
NAND

FIG. 40

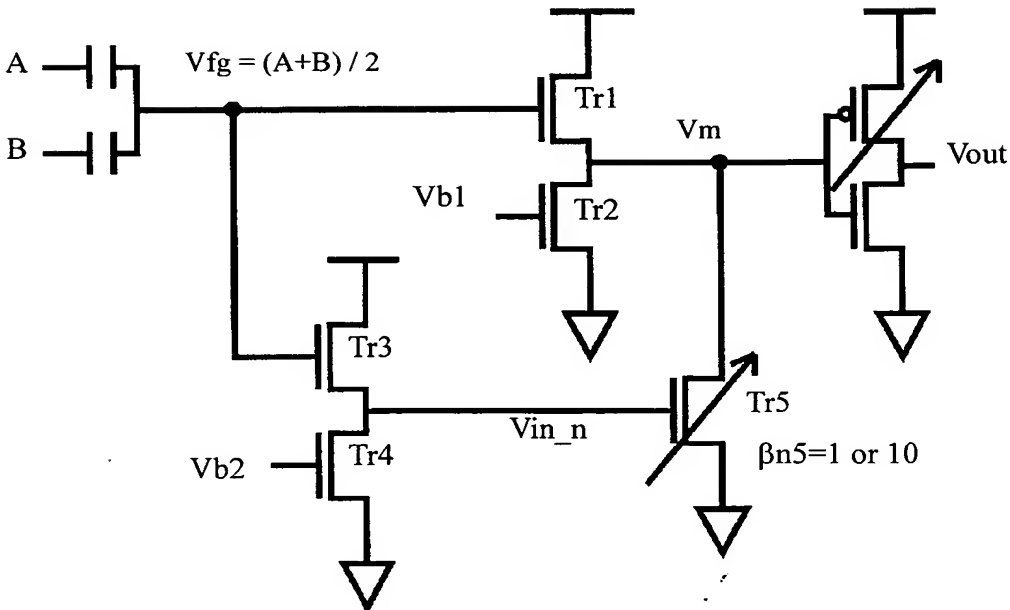


FIG. 41

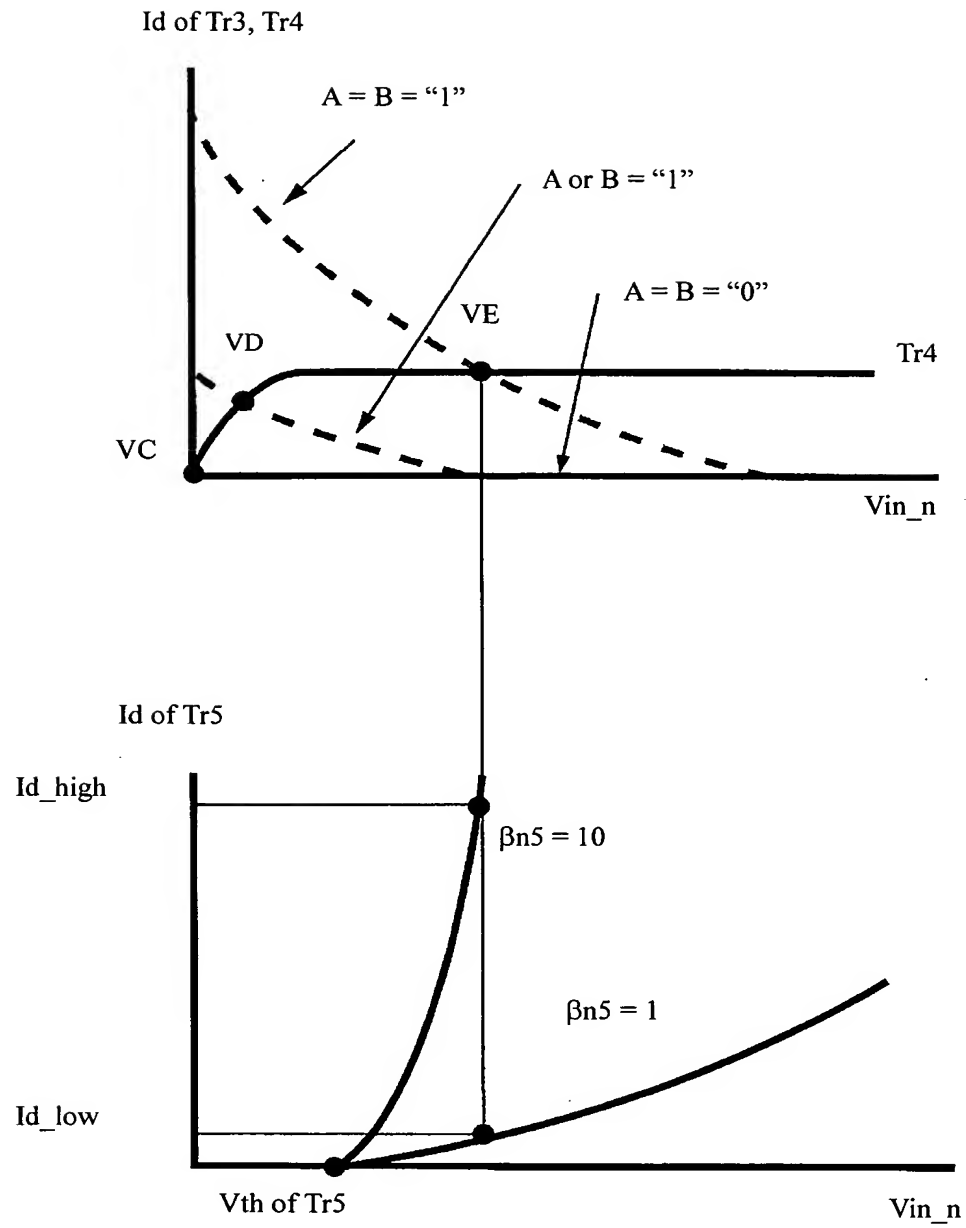


FIG. 42A

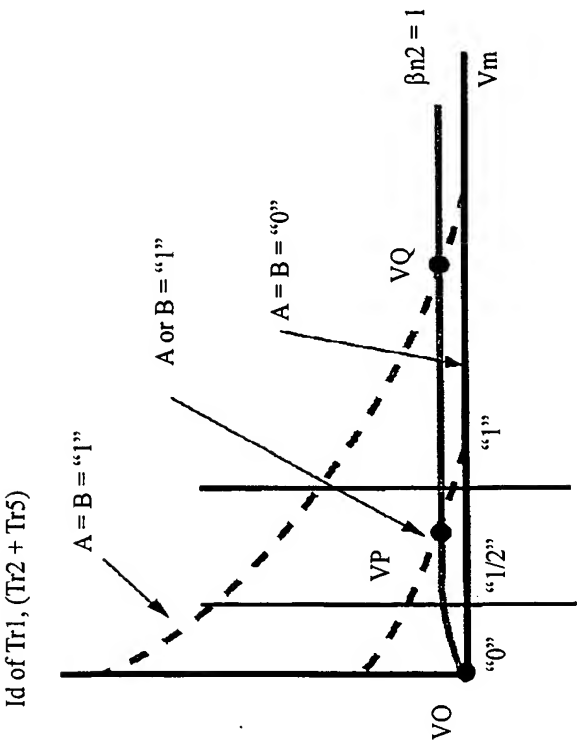


FIG. 42B

		Vout	
A	B	Vinv_low	Vinv_high
0	0	1	1
0	1	0	1
1	1	0	0
		NOR	NAND

FIG. 43A

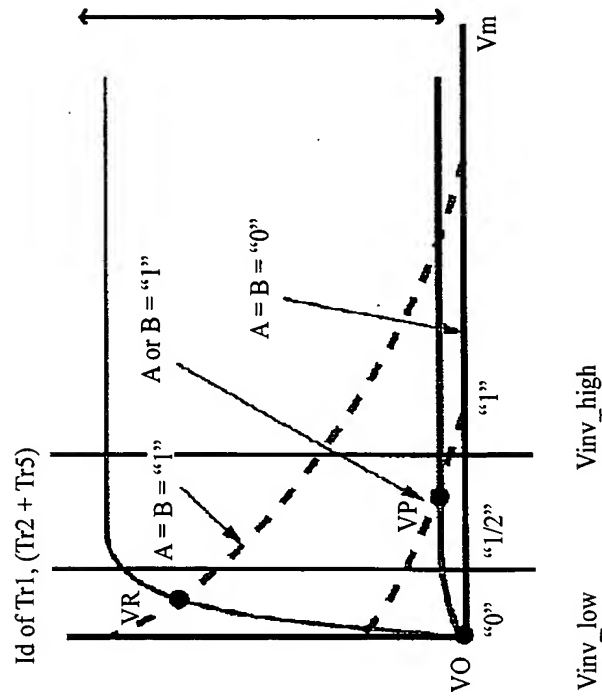


FIG. 43B

		I_d_high				V_{out}	
A	B	V_m	V_{inv_low}	V_{inv_high}			
0	0	V_O	1	1			
0	1	V_P	0	1			
1	1	V_R	0	0			
					XNOR	All "1"	

FIG. 44

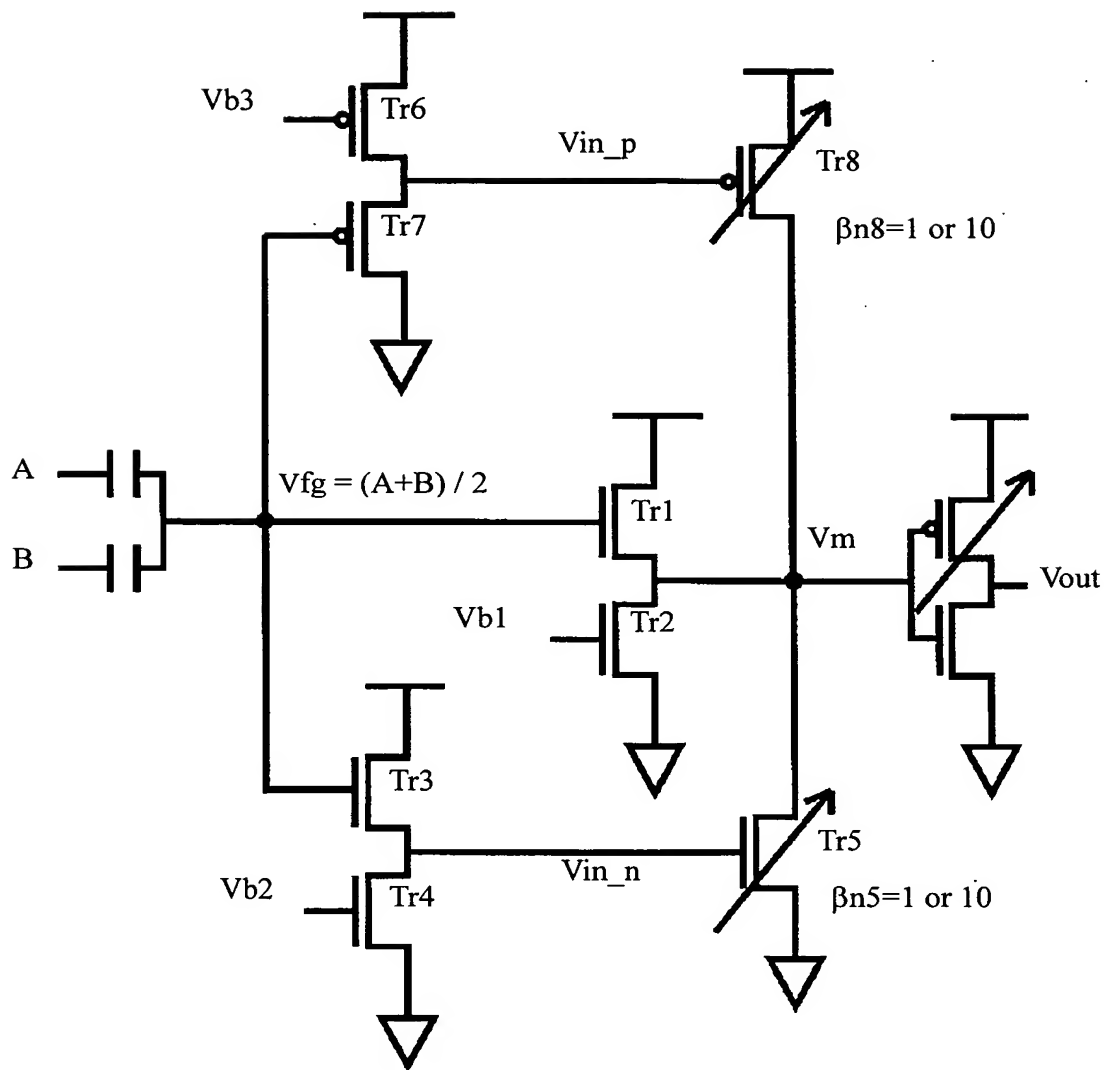


FIG. 45

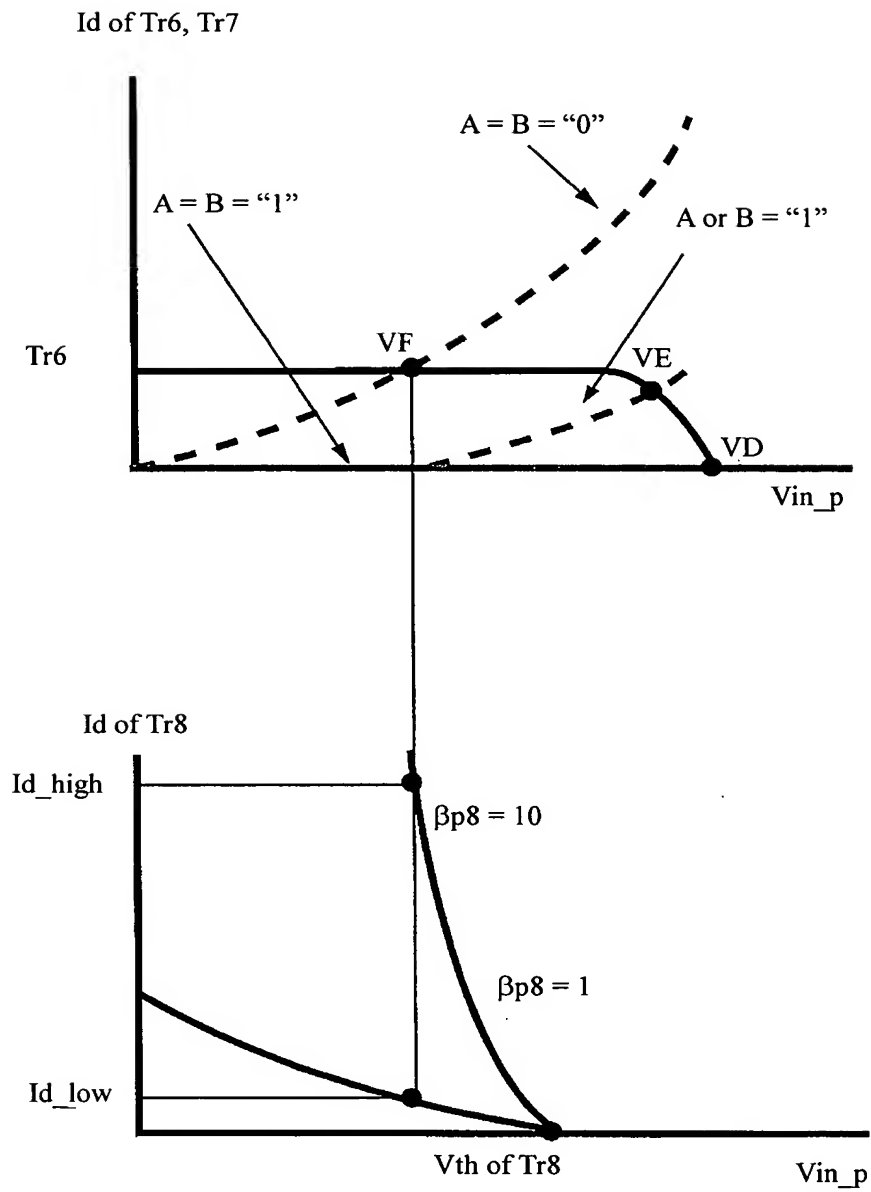
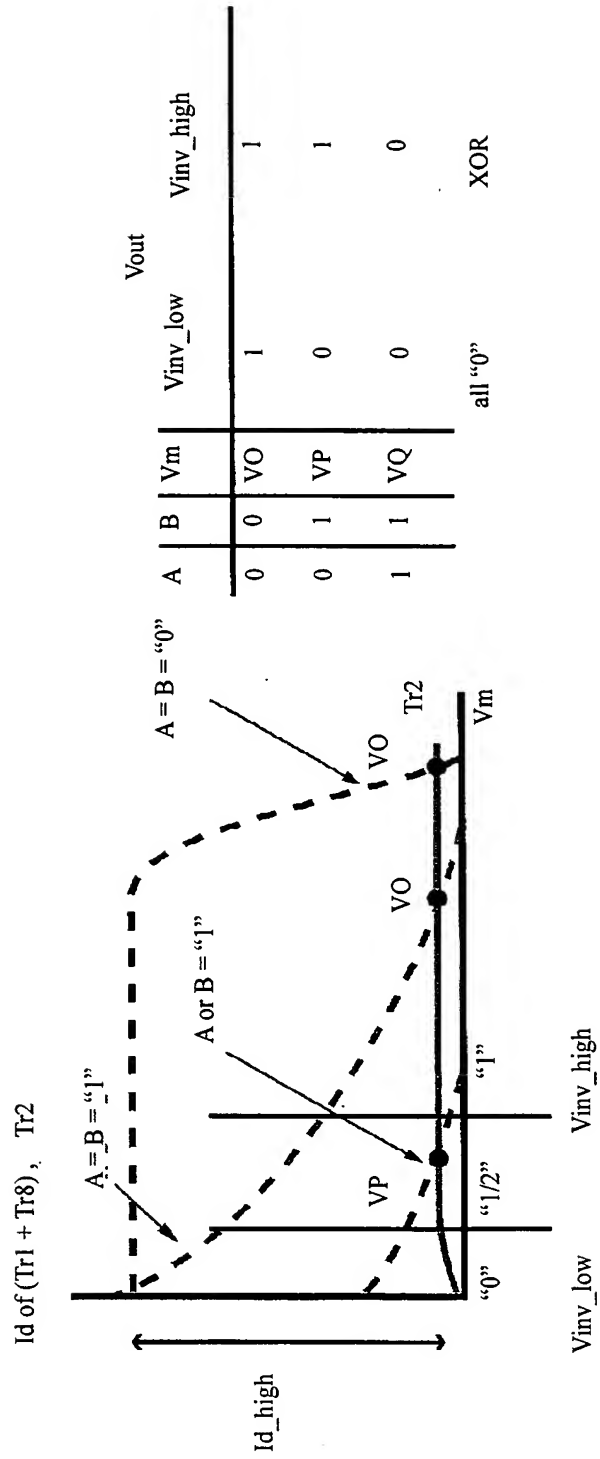


FIG. 46A

FIG. 46B



$$\beta n5 = 1, \beta p8 = 10$$

FIG. 47A

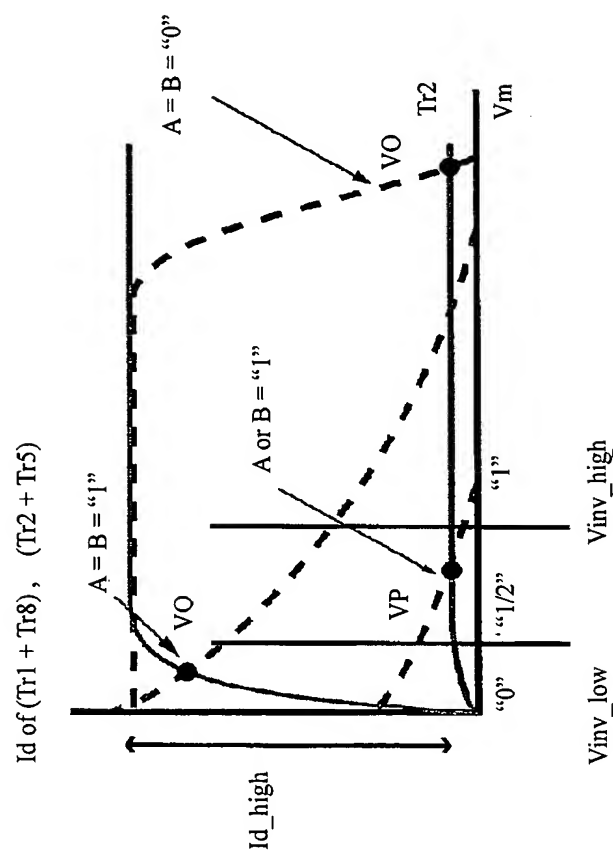


FIG. 47B

		Vout	
		Vinv_low	Vinv_high
A	B		
0	0	1	1
0	1	0	1
1	1	0	0
		AND	OR

FIG. 48

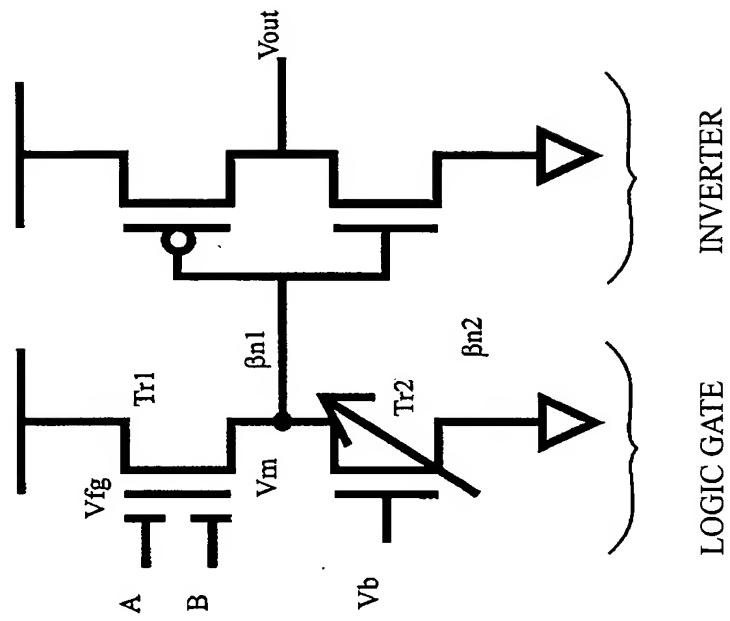


FIG. 49

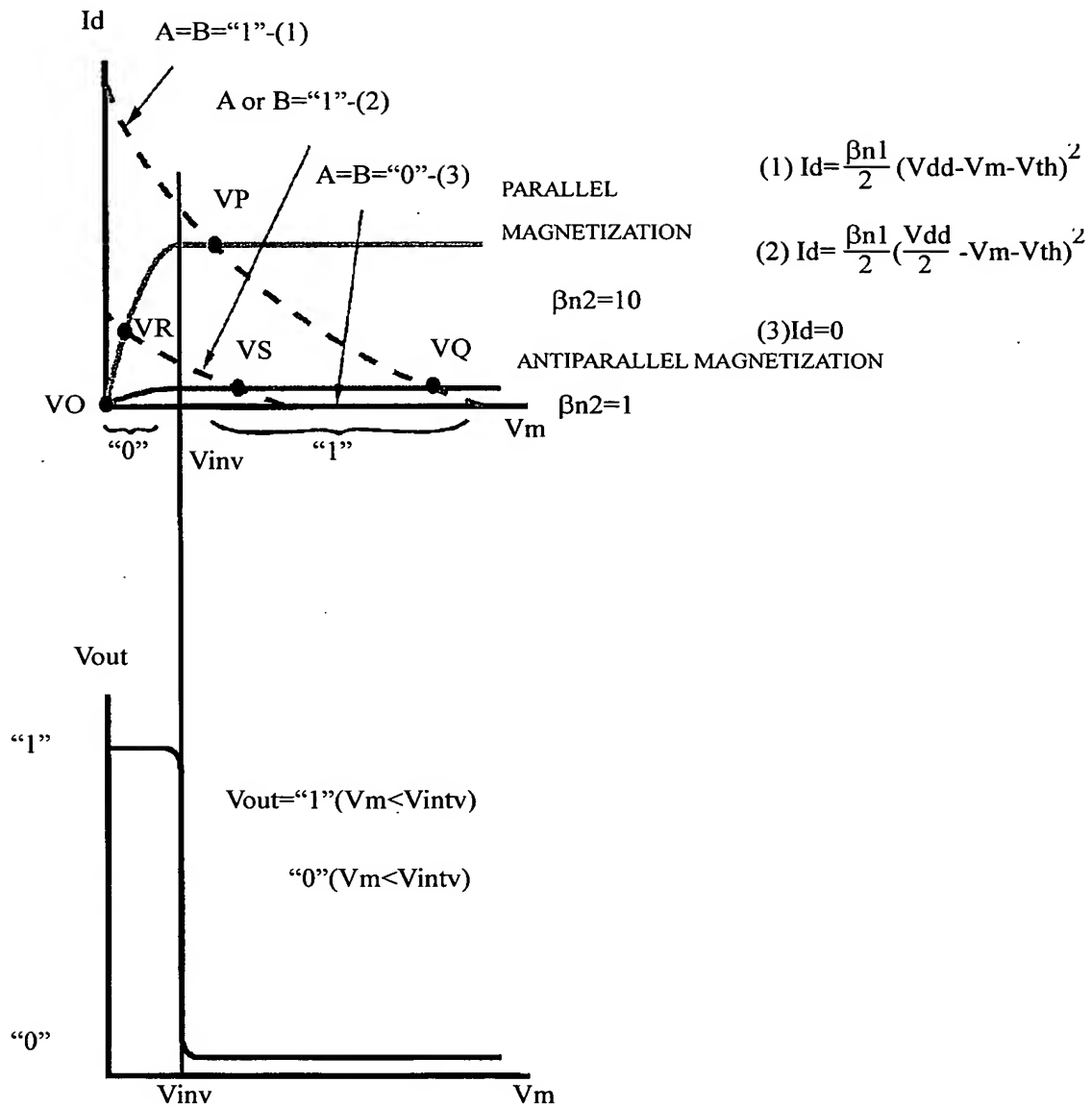


FIG. 50

$\beta_{n2} = 1$				$\beta_{n2} = 10$			
A	B	Vm	Vout	A	B	Vm	Vout
0	0	VO	1	0	0	VO	1
0	1	VS	0	0	1	VR	1
1	1	VQ	0	1	1	VP	0
NOR				NAND			

FIG. 52A

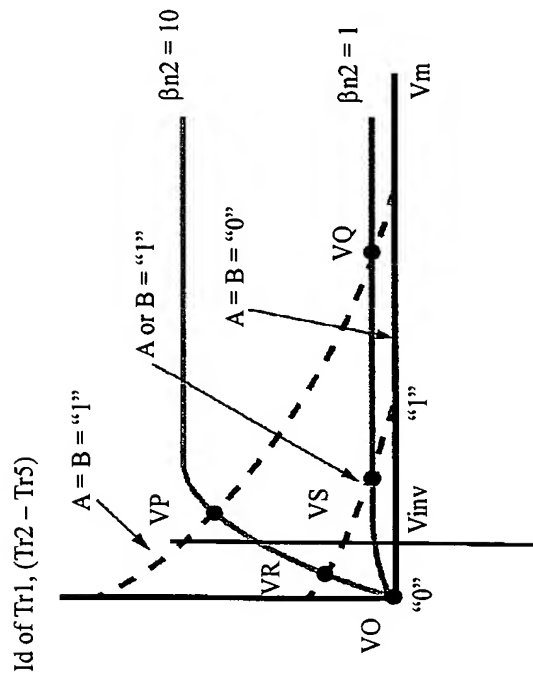


FIG. 52B

$\beta_{n2} = 1$				$\beta_{n2} = 10$			
A	B	V _m	V _{out}	A	B	V _m	V _{out}
0	0	VO	1	0	0	VO	1
0	1	VS	0	0	1	VR	1
1	1	VQ	0	1	1	VP	0

NOR

NAND

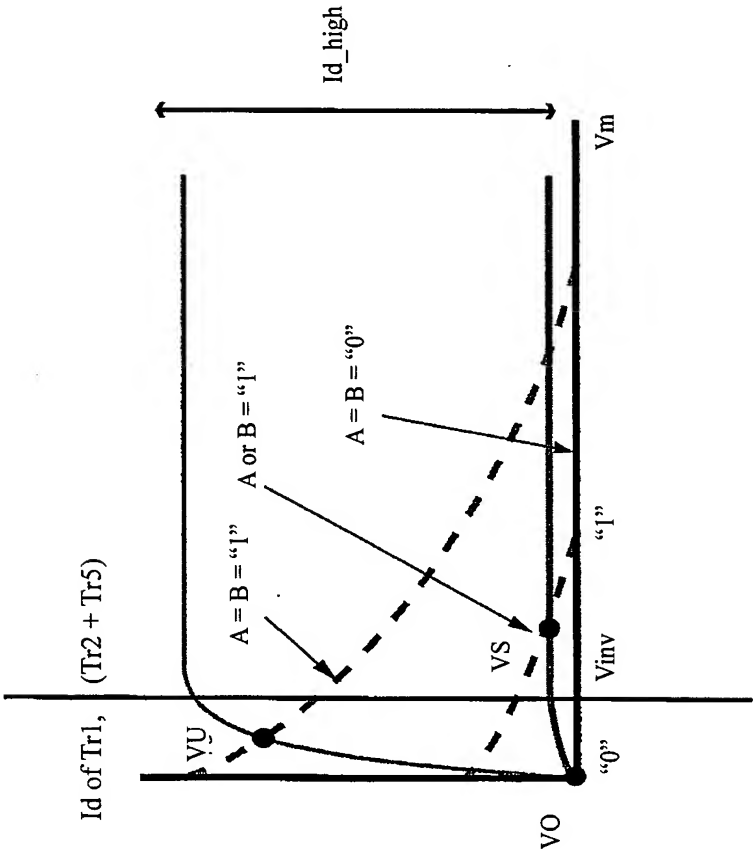
$\beta_{m5} = 1, \beta_{n2} = 1 \text{ or } 10$

FIG. 53B

A	B	V _m	V _{out}
0	0	VO	1
0	1	VS	0
1	1	VU	1

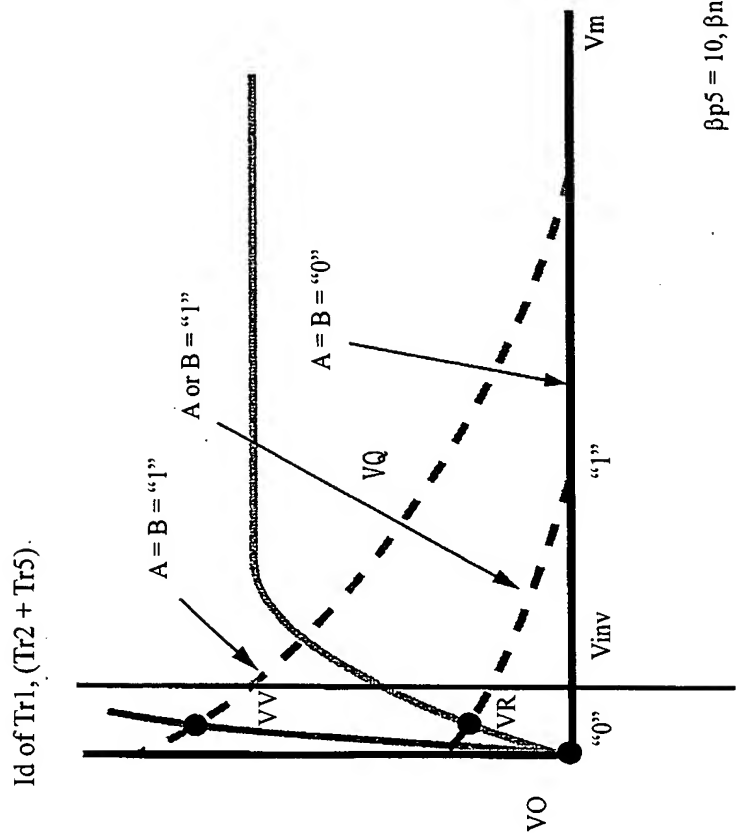
XNOR

FIG. 53A



$\beta_{p5} = 10, \beta_{n2} = 1$

FIG. 54A



$$\beta p5 = 10, \beta n2 = 10$$

FIG. 54B

A	B	Vm	Vout
0	0	VO	1
0	1	VR	1
1	1	VV	1

all "1"

FIG. 55

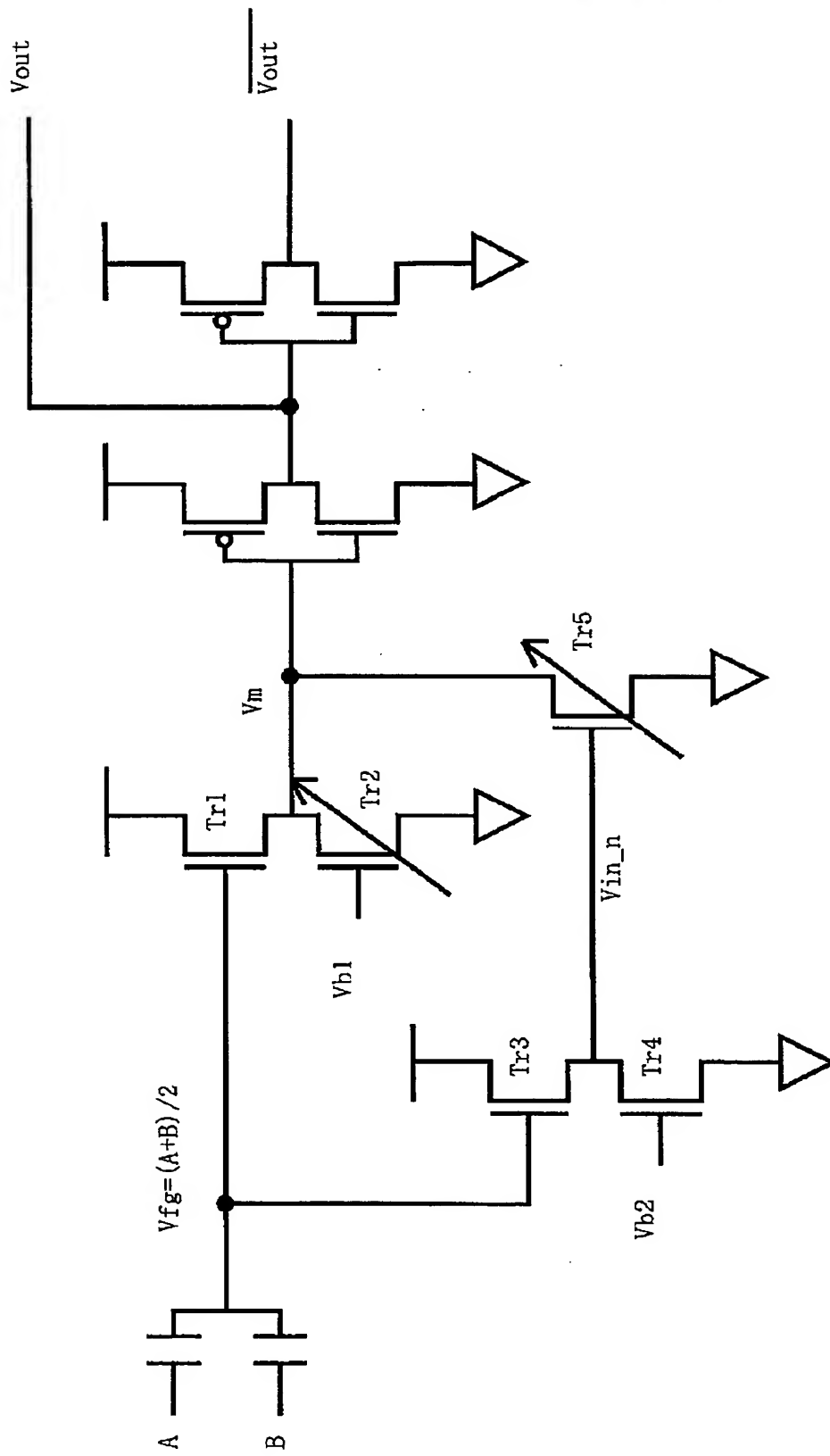


FIG. 56

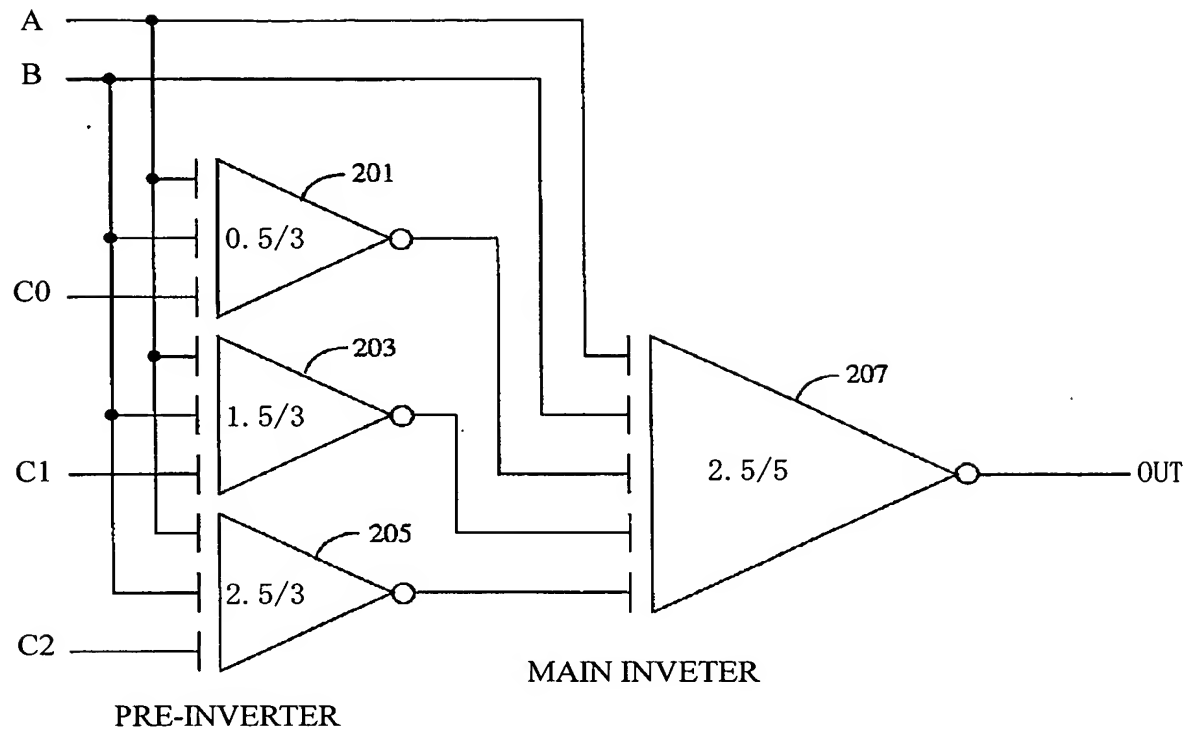


FIG. 57A

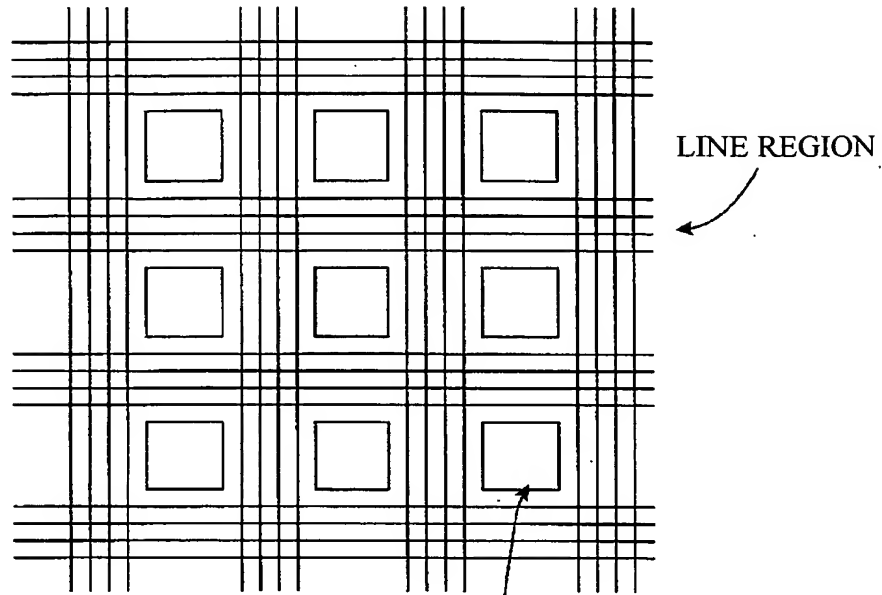


FIG. 57B

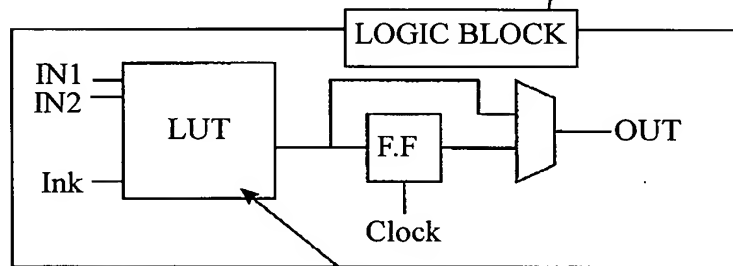


FIG. 57C

